Nov. 15, 1966 H. V. IVORY ETAL 3,285,251

LOOSE LEAF BINDER

Filed July 6, 1965 2 Sheets-Sheet 1

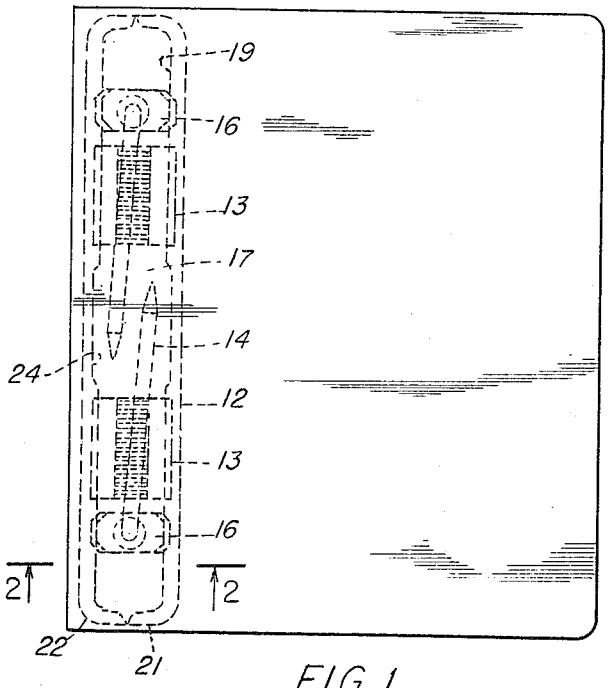

FIG. 1

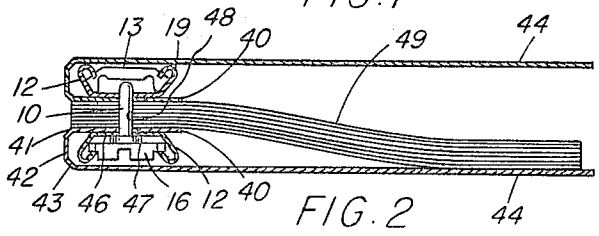

FIG. 2

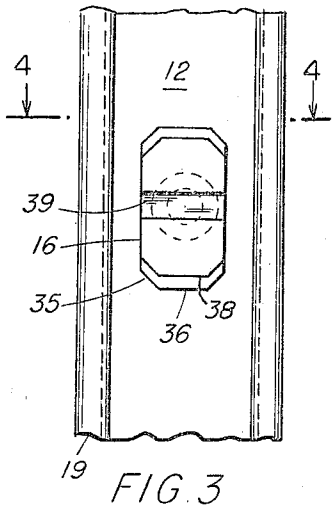

FIG. 3

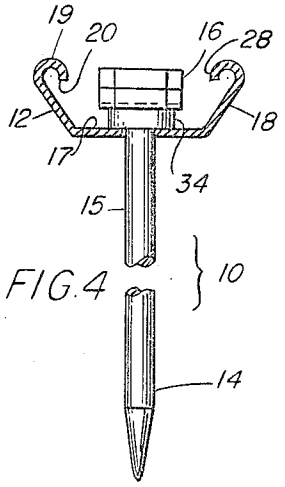

FIG. 4

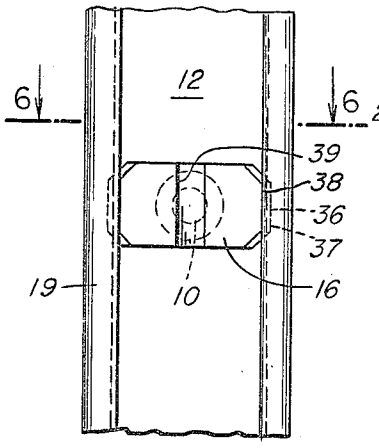

FIG. 5

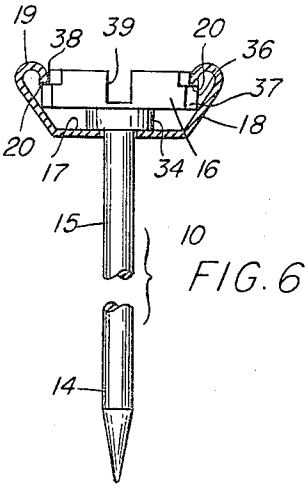

FIG. 6

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LOOSE LEAF BINDER

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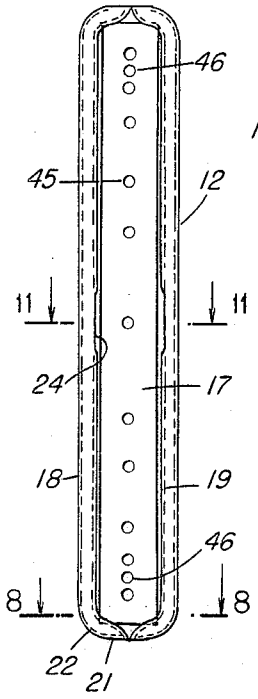


FIG. 7

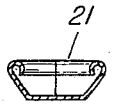
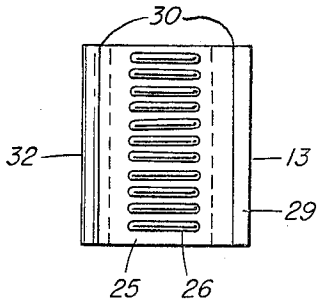


FIG. 8

FIG. 10



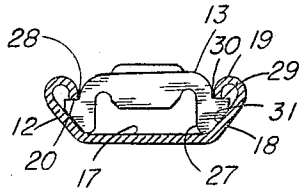


FIG. 9

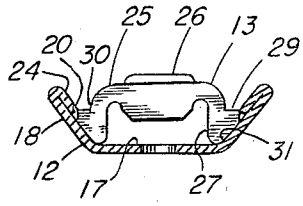


FIG. 11

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LOOSE LEAF BINDER

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2 Claims. (Cl. 129—25)

This invention relates to loose leaf binders, particularly of the type suitable for temporary filing of technical data information sheets. However, it may be used for filing any sort of perforated loose sheets or leaves.

In this type of binder sheets are removably bound together between front and back binding elements by removable flexible posts which are frequently made of stiffly flexible plastic material such as nylon. One end of the post is removably secured in one of the binding elements, the other end of the post is passed through perforations in the sheets and then into the other binding element where it is bent over and held in place by a sliding latch.

Such binders are usually temporary, so that it is desirable to have them as inexpensive as possible.

Parts of the binders sometimes become damaged in use, but in known binders it has been tedious, and as to some parts impossible, to replace them. In these cases the whole binder had to be replaced, adding greatly to the expense of the user.

The most usual means of securing a flexible plastic post in the binding element have been complementary screw threads on the post and binding element. This construction has several disadvantages. In normal use of the binder the posts are frequently removed and replaced in the binder. It was often unduly time consuming to unscrew the post from the binder or to screw the post into the binder. Also due to the relatively soft material of the nylon posts, the screw threads were frequently damaged and had to be discarded. Another disadvantage of the threaded post is the expense to manufacture, in that the binder must go through a tapping operation so that it may properly receive a threaded nylon post.

Another disadvantage of known binders was that if the sliding latch for the free end of the post became jammed or otherwise damaged, it could not be replaced, and the whole binder had to be discarded.

An object of the present invention is to provide an improved post which can be quickly and easily removed from or locked into the binding element.

Another object is to provide a binder in which a latching slide can easily be replaced in a binding element.

Another object is to provide an improved binder which can be economically produced.

Other objects will appear from the specification and claims.

In the drawings:

FIGURE 1 is a top plan view of a binder embodying the invention. It shows a top cover of the binder closed, with a binding element, plastic posts and sliding latches in dotted lines.

FIGURE 2 is a cross section through the loose leaf binder of FIG. 1 on line 2—2 looking in the direction of the arrow. It shows a plastic post having its head locked in the lower binding element, its intermediate portion passing through sheets bound in the book, and its free end bent over in the upper binding element and held in place by a latch which slides in the upper binding element.

FIGURES 3–6 are details of an enlarged scale of the flexible post and a section of the lower binding element of FIG. 2.

FIGURE 3 is a bottom plan view of the binding element and of the head of the post with the head in open or unlocked position.

FIGURE 4 is a cross section on line 4—4 of FIG. 3.

FIGURE 5 is a view similar to FIG. 3, but with a post in locked position.

FIGURE 6 is a cross section on line 6—6 of FIG. 5 showing the free end of the post protruding through an aperture in the binding element and with the head of the post securely held or locked in the binding element.

FIGURE 7 is a top plan view of a channel comprising a binding element.

FIGURE 8 is a cross section on line 8—8 of FIG. 7 looking in the direction of the arrow. It shows an end wall of the channel.

FIGURE 9 is an end view on an enlarged scale of a sliding latch which secures the free ends of the plastic posts in place in a top binding element. It is substantially a view on an enlarged scale of the top binding element in FIG. 2.

FIGURE 10 is a top plan view of the latch of FIG. 9 or FIG. 11.

FIGURE 11 is a view on an enlarged scale similar to FIG. 9, but with the latch in a removal door in the channel substantially at a cross section on FIG. 7 on line 11—11.

The basic parts of the loose leaf binder shown are a flexible post **10**, which holds together two binding elements **12**, and a latch **13** which slides in one of the binding elements and releasably holding in place the free ends **14** of the post, as shown in FIGS. 1 and 2.

The post is preferably made of stiffly flexible plastic such as nylon. It includes a free end **14**, an intermediate portion **15** and an elongated head **16**, which will be described in more detail in connection with the binding element.

The two binding elements **12** are preferably identical. The binding elements may be made of metal, plastic or other known material. Each is designed to cooperate equally well optionally to lock the head of the post in place and alternatively to retain the latch in sliding relation. See especially FIGURES 2, 6 and 9.

For convenience, we shall refer to the binding element which holds the head **16** of the post as the bottom or lower element, and the one which carries latching slide **13** as the upper binding element. This is not to be taken as a limitation. It is clear that either the head of the post or the latch can be in uppermost position. In use the position of the parts will from time to time be changed.

The binding element **12** is an elongated channel substantially the length of the binding edge of the binder. See especially FIGS. 1 and 7. It comprises a floor **17**, a pair of side walls **18** each having a U-shaped flange **19** extending inwardly over the floor so that it has a median surface **28** spaced inwardly from side wall **18** as shown in FIGURES 4 and 9. If desired the walls **18** may meet the floor substantialy at a right angle. In the preferred form the internal angle between the floor and the wall is an obtuse angle, as shown for example in FIGS. 2, 4 and 9. Free edge **20** of the flange is spaced vertically from the floor and is substantially parallel to the floor, and is spaced horizontally from the adjoining wall **18**.

The channel has end walls **21** which serve as stops to prevent accidental removal of the sliding latch. Each side wall **18** is preferably integral with that half of the end wall which it adjoins, with a smoothly curved corner **22** joining the side and end walls. The U-shaped flange **19** preferably extends around the corner **22**, but it may be flattened down at the center of the end.

At the center of the channel the flange is flattened against the side wall **18** as shown in FIG. 7, for a distance substantially the length of the sliding latch to form a

door **24** for replacement of the latch, as will be explained hereafter.

Sliding latch **13** has a substantially flat hoizontal top **25**, which may if desired have raised or otherwise roughened finger areas **26** to facilitate manipulation. See especially FIGS. 9, 10 and 11.

A pair of legs **27** extend substantially at right angles from the top. The relative dimensions of the sliding latch and the channel are such that when the bottom of the legs rest on the floor **17** of the channel, the highest part of the latch (in this case the top of the finger pieces **26** on the top **25**) is substantially flush with the top of the side walls of the channel, and the width of the upper portion **30** of the latch is substantially the same as the distance between the median surfaces **28** of the U-shaped flanges **19**.

Below the upper portion **30** a horizontal ear **29** projects outward from the side of the latch intermediate its height, and fits slidably under the free edge **20** of the U-shaped flange. The outer edge **31** of the latch from the top of the ear to the bottom of the latch is substantially parallel to the inside of the adjacent wall of the channel.

The width of the latch at the ears is such that it substantially fills the width of the channel under the open area of the U-shaped flange, with sufficient tolerance to permit the latch to slide easily in the channel. As pointed out above, the length of side **32** of the latch, is substantially the same as the length of the door **24** in the side walls of the channel, which door is formed by flattening the U-shaped flange against the side wall, so that the edge **20** is pressed close against its wall **18**, as shown in FIG. 11. In this position it may slightly overlie ear **29** of the latch. However, the metal or plastic substance of the channel has a slight spring which allows the channel walls to spring apart enough to permit a latch to be inserted in the channel by pressing it down from above.

The post is preferably substantially circular in cross section.

The head **16** of the post **10** is also designed with dimensions to cooperate with the channel. See especially FIGURES 3–6. The head may, if desired, include a circular neck **34** adjoining the intermediate portion **15** of the post, which is larger in cross section than the post, but less than the head. The head is elongated, and may be substantially oval or rectangular. In the preferred form shown in the drawings the corners of the head are cut away at **35** giving it an octagonal shape. The total height of the head including the neck, if any, is not more than, and preferably is less than the height of the channel between the tops of the U-shaped flange. The greatest width of the head is less than the distance between the U-shaped flanges of the channel. See FIGS. 3 and 4. The greatest length of the head is greater than that distance, and preferably extends substantially from wall to wall below the free end **20** of the flange.

Intermediate the height of the head a tongue **37** extends outward toward each side wall **18** so that the free edges **20** of the U-shaped flanges bear upon the tongues and hold the head against accidental displacement. The combined height of the neck and tongue is substantially equal to the distance between the floor of the channel and the free edge **20** of the flange.

When the longer dimension of the head is placed across the channel, as shown in FIGS. 5 and 6, ends **36** of the head including tongues **37** lie under the U-shaped flanges, and the free edges **20** of the flange, and the tongues **37** of the head and the flanges press against each other and so hold the head firmly in place.

The head of the post has across its longer dimension intermediate its ends **36** above the tongues, a pair of vertical walls **38** which are substantially the same distance apart as the median surfaces **28** of the U-shaped flanges and are also substantially the same width as the upper portion **30** of latch **13**, as illustrated in FIGS. 6 and 9.

This enables the median surfaces **28** of the U-shaped flanges of each binding element to cooperate optionally with the head of the post or with the upper portion of the latch, while the free edges **20** of the U-shaped flanges cooperate with tongue **37** of the head of the post or with the top of the ear **29** of the latch, respectively, as shown in FIGS. 6 and 9.

Across the center of the narrower dimension of the head a recess **39** is provided to receive a screw driver, coin, or similar tool for turning the head.

In the completed binder each binding element **12** is attached to a conventional strip **40**, which is hinged at **41** to a back portion **42** and at **43** to a cover **44** of the binder. The strip, back, cover and hinges may be made of press board or other known material, and may be made of one continuous piece of material, as shown in FIG. 1, or they may be separate pieces.

The floor of the binding element has a plurality of openings **45** through which rivets or eyelets connect the binding element to the strip. See FIGURE 7. At least one pair of openings **46** comprise passages for the posts and are aligned with similar passages **47** in strip **40** and passages **48** in the sheets or leaves **49** to be bound in the book.

In using the binder, the free end of the post is inserted through passage **46** in the floor **17** of a binding element until the underside of the head **16**, or neck **34** contacts floor **17** of the binding element. During this process the head of the post is held in, or is turned to, the position shown in FIGS. 3 and 4, that is to say with the longer dimension of the head lying lengthwise of the binding element. When the head is in this position the post can be inserted in or withdrawn from the binder at will. To lock the post in the binder the operator gives the post a quarter turn, either clockwise or counterclockwise to the position shown in FIGS. 5 and 6. In this locked position the ends **36** of the head lie outward in the area covered by the U-shaped flange, and the tongues **37** and the free edges **20** of the flanges bear against each other and hold the post locked in the binding element. To unlock and remove the post, the operator must again turn the head substantially a quarter of a turn in either a clockwise or a counterclockwise direction.

The operator can turn the post with a coin such as a dime or a tool such as a screw driver can be inserted in the recess **39** in the post head and the turn can be made by that means.

After the free end of the post has gone through passage **46** in one of the binding elements the free end of the post is inserted through passage **47** in a binding strip, through passage **48** in sheets **49** then through a passage **47** of the second binding strip and passage **46** in the second binding element. If the head of the post was not previously turned to locking position in the binding element, it should be so turned and locked at this point in the operation. The second binding element is then pushed down firmly upon the sheets and the free ends of the posts are bent over to lie on the floor of its channel. One of the sliding latches **13** is slid over the free end of each post and toward the head of that post to the position shown in FIG. 1. The posts will be held in the desired position by friction between the post and the sliding latch and friction between the latch and the side walls and flange of the channel.

When it is desired to open the binding element, either to remove sheets or to add more sheets, the latches are slid in the opposite directions until they uncover the free ends of the posts; the second binding element, with its attached binding strip and book cover, is removed from the posts, and the sheets are then rearranged. If desired, the post heads can be turned and thus unlocked from and then withdrawn from the second binding element. However, this is not usually desirable unless all the sheets are to be removed from the binder.

The sliding latches are customarily placed in the second binding element by the manufacturer. Ordinarily, the user has no need to remove or replace the latches. However, if the latches become broken or jammed and have to be removed, new latches can be put in. To do this the user places the bottom of the latch in the replacement door **24**, and pushes down on the latch. The distance between the flanges in the door may be less than the greatest width at the ears of the latch, but the channel being of a spring substance such as metal or plastic, the walls of the channel in the door will spring apart and permit the insertion of the sliding latch into the channel, and then will spring back so that the free edge of the flange rests above the ear of the latch.

We claim:

1. A loose leaf binder having binding means connected by flexible plastic posts removably secured by their heads to one of the binding means and a sliding latch in the other binding means to retain the free ends of the posts, said binding means comprising a channel having a floor and side walls, each side wall having an inwardly extending flange, wherein the improvement comprises said flange being U-shaped and having a median surface spaced inwardly from the adjoining side wall and a free edge spaced horizontally from said side wall and vertically from the floor, in combination with the removable post having a head with a shorter dimension which is less than the distance between the flanges, and a longer dimension substantially equal in length to the distance between the side walls of the channel adjacent the free edge of the flange, said longer dimension having a tongue at each end and having a pair of vertical walls above the tongue spaced apart by a distance substantially equal to that between the median walls of the flanges, whereby when the head is lengthwise of the channel the post head can readily be placed in or removed from the channel, and when the head lies crosswise of the channel said vertical walls above the tongue cooperate with the median surfaces of the U-shaped flanges, and the ends of the tongue lie between the floor and free edges of the U-shaped flanges and contact said free edges, thereby locking the post in the binding element.

2. A loose leaf binder according to claim **1** wherein the improvement includes the latch having a horizontally projecting ear below an upper portion, the width of said upper portion, the distance between the vertical walls of the head of the post, and the distance between the median surfaces of the U-shaped flanges being substantially the same, whereby the median surfaces of the U-shaped flanges cooperate with either said vertical walls of the post or said upper portion of the latch and the free edges of the flange cooperate with either the tongue of the post head or the ear of the latch to hold in the binding element optionally the head of a post or a latch.

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