United States Patent

Shears

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[54] **UNITARY SHEET METAL KEY LOOP RETAINER**

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[73] Assignee: **TRW Inc.**, Cleveland, Ohio

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[52] **U.S. Cl.** .....**70/456 B**

[51] **Int. Cl.** **A47g 29/10**

[58] **Field of Search** .....70/456 B, 456 A, 457, 458, 70/459; 150/40; 24/3 K

[56] **References Cited**

UNITED STATES PATENTS

3,006,182	10/1961	Hanna	70/456 B
3,008,323	11/1961	Legat	70/456 B
3,132,504	5/1964	Beilis	70/456 B
3,309,905	3/1967	Shepherd	70/456 B

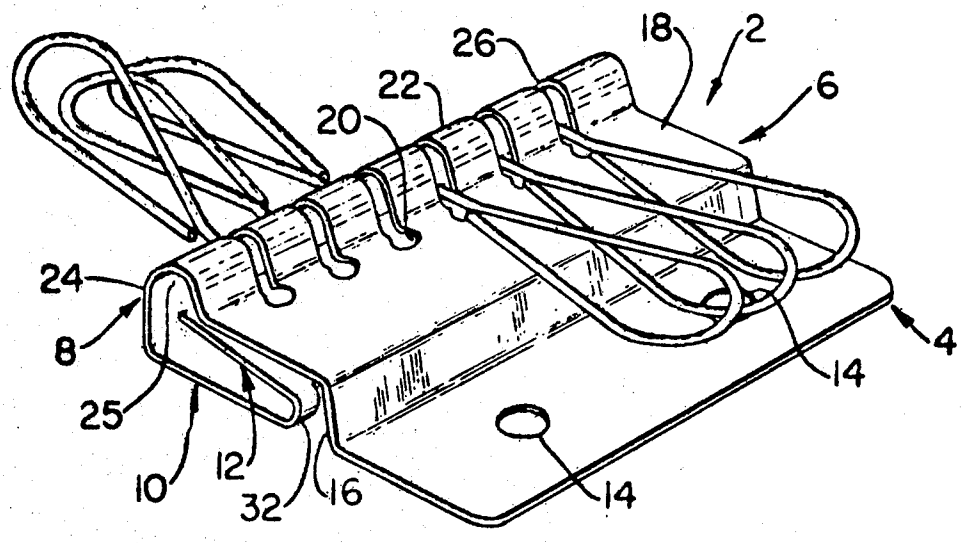
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[57] **ABSTRACT**

A one piece sheet metal key loop retainer has a leaf spring integrally joined to the forward end of its key loop retainer section through a reversely bent bight. The leaf spring underlies each of a plurality of loop head receiving openings in the loop receiving section of the retainer and terminates in a free end lying above the loop receiving openings.

5 Claims, 4 Drawing Figures



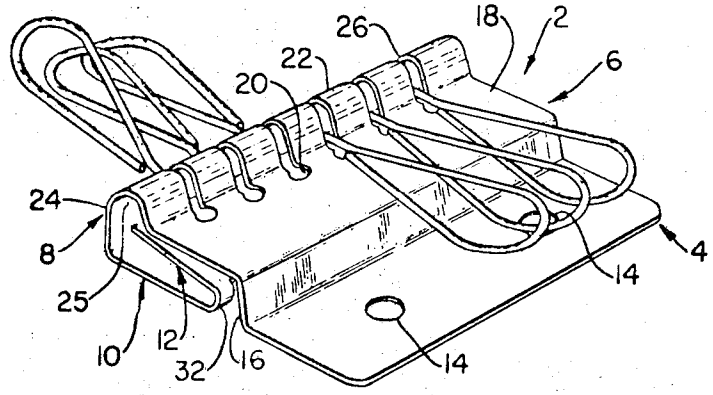


FIG. 1

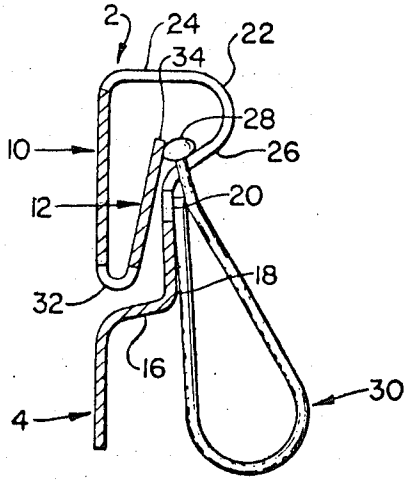


FIG. 2

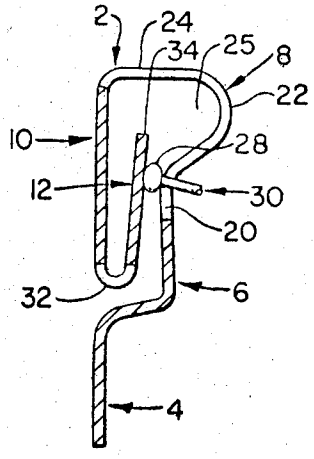


FIG. 3

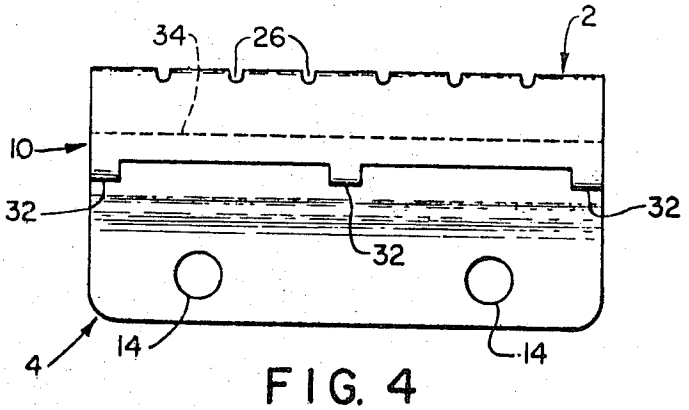


FIG. 4

UNITARY SHEET METAL KEY LOOP RETAINER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to key loop retainers and more particularly to retainers of unitary spring metal construction which are adapted for use in both hard and soft backed key cases.

2. Description of the Prior Art

The most pertinent prior art retainers known are found in the disclosures of U.S. Pat. No. 3,006,182 (E. Hanna) and U.S. Pat. No. 3,132,504 (H. J. Beilis). The retainer disclosed by Hanna is of multipart construction and its manufacture necessitates time consuming and therefore cost increasing secondary operations for securing the separate leaf spring to the body or base of the retainer. A further operation is required to turn down the rearward edges of the upper key loop receiving section in order to insure that the said section remains spaced from the body of the retainer and to preclude the said section from collapsing on the leaf spring. Like Hanna, the key retainer disclosed by Beilis has a so-called box construction wherein the edges of the key loop receiving section are turned down to brace the said section and maintain it in spaced relationship with respect to the body of the retainer. Further, by reason of the fanlike configuration of the individual spring elements of Beilis, which are formed integral with the upper loop receiving section of his retainer, an excessive amount of stock must be removed from the blank during formation of that patented device.

Thus, the present invention's contribution to the art is seen to reside in a key loop retainer of unitary, simplified construction which lends itself to production through a minimal number of manufacturing operations with a significant reduction in material waste, which retainer functions in a highly efficient manner whether installed in a hard or soft backed key case.

SUMMARY OF THE INVENTION

A one piece, sheet metal key loop retainer. A key loop receiving section extends forwardly and upwardly from the base of the retainer and has a plurality of through openings formed therein. The openings are generally circular and of a diameter slightly greater than the spherical head on the wire key loops used with the retainer. A key loop retaining section initially extends forwardly and upwardly from the loop receiving section and then downwardly toward an imaginary planar extension of the base and defines a loop head holding chamber. A plurality of parallel slots are formed in the loop retaining section and each of the slots opens into communication at one end with one of the openings in the loop receiving section and is closed at its opposite end. The width of each slot is slightly less than the diameter of the spherical head of the key loops to be retained. A forward support section (which is integrally joined to the forward lower end of the loop retaining section) extends rearwardly toward the base and lies generally coplanar with the base. A leaf spring is integrally joined to the rearward end of the forward support section by a reversely bent bight and extends upwardly from the forward support section in normally divergent, tensioned relationship with respect to that section. The leaf spring underlies each of the openings in the loop receiving section and terminates in a free end lying above the said openings and within the loop head holding chamber.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a retainer according to the invention having six key loops seated therein;

FIG. 2 is a cross sectional view of the retainer of FIG. 1 taken through the center of one of the openings and slots in the key loop receiving and retaining sections, respectively, with a key loop depicted in full and in a typical position wherein it is about to be withdrawn from the retainer;

FIG. 3 is a cross sectional view of the retainer similar to FIG. 2 depicting a fragmentary portion of a key loop in full as it is being inserted into the retainer; and

FIG. 4 is a bottom plan view of the retainer absent the key loops.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A loop retainer according to the invention may be conveniently manufactured from a carbon steel blank which is worked and formed while in a soft, e.g. annealed, state and thereafter tempered by heat treating to render the metal springy as will be well understood by those skilled in the metal working arts.

The illustrated retainer **2**, as a finished product, is of unitary spring metal construction and generally includes a base **4**, a key loop receiving section **6**, a key loop retaining section **8**, a forward support section **10**, and a leaf spring **12**.

The base **4** has a pair of openings **14** formed therein for the receipt of rivets, eyelets or other convenient fastening means which are utilized to secure the retainer to the frame of a key case.

The loop receiving section **6** commences in a substantially vertical first portion **16** which extends outwardly or upwardly from the base and merges into a second portion **18** which extends forwardly, generally parallel to the plane of the base. A plurality of generally keyhole shaped openings **20** are formed in the portion **18** adjacent its end remote from the base **4**.

The key loop retaining section **8** extends outwardly or upwardly from the end of the loop receiving section adjacent openings **20** in an arcuate, reversely bent portion **22** and thence continues downwardly or inwardly in a generally straight wall portion **24** toward an imaginary planar extension of the base **4**. The key loop retaining section defines what might best be termed a loop head holding chamber **25**. A plurality of spaced parallel slots **26** are formed in the loop retaining section **8** and extend through both portions **22,24** thereof. At one end the slots are in open communication with the openings **20** with their opposite ends being closed adjacent the lower end of the portion **24**. The diameter of the enlarged circular portion of the openings **20** and the width of the slots **26** are selected so that the former is slightly greater than and the latter slightly less than the diameter of the spherical head **28** of the wire key loops **30** used with the retainer.

The forward support section **10** extends rearwardly toward the base from the lower end of the front portion **24** of the loop retaining section and lies generally coplanar with the base. Leaf spring **12** is joined to the end of the forward support section proximate the base

through a plurality of reversely bent webs or bights **32** and extends forwardly from the webs in normally divergent, tensioned relationship with respect to the forward support section and terminates in a free end **34** which, as most clearly depicted in FIGS. **2** and **3**, lies above the openings **20**. The spring **12**, when at rest, is biased against the upper portion of the retainer at the junction of the loop receiving and loop retaining sections and immediately underlies each of the openings **20**.

A key loop is installed in the retainer as best depicted in FIG. **3** by manually passing the loop head **28** through the enlarged, generally circular portion of an opening **20** and depressing the leaf spring **12** toward the forward support section **10** against the bias of the webs **32** until the loop head clears the undersurface of the loop receiving section, and thereafter pulling the loop forwardly into a slot **26** in the loop retaining section. When the loop head **28** clears the free end **34** of the spring, the latter snaps back to its normal position depicted in FIG. **1** and the loop head is in effect trapped in the chamber **25**. The installed key loops are of course pivotal throughout the length of the slots **26** for the movement of one or more keys attached thereto into or out of a key case in the well-known manner. The leaf spring **12** accordingly provides a movable restriction to the re-entry of the head or an installed key loop into the opening **20** and thereby inhibits accidental release of a key loop under normal conditions of usage of the retainer.

The disclosed preferred embodiment depicts three reversely bent webs **32** connecting the leaf spring to the forward support section. The reader will of course appreciate that one, or two or more than three webs might be utilized and that in fact the spring might be connected through a continuous unbroken web or bight extending across the full width of the retainer depending on the springiness of the material and the easiness or hardness of action desired in the spring's operation. In any case it is obvious that the only material removed from the initial blank during manufacture of the retainer which might be considered lost scrap or waste is that which is removed to provide the gaps between the spring connecting webs. Thus, the object of providing a simple economical and yet highly efficient one piece key loop retainer has been realized.

The reader will also appreciate that the foregoing detailed description should be interpreted in illustrative as opposed to a limiting sense in that it is obvious that one of ordinary skill in the art could effect changes and modifications in the preferred embodiment which would be within the scope of the invention as defined by the claims that follow.

I claim:

1. A one piece, sheet metal key loop retainer comprising a base, a loop receiving section extending forwardly and upwardly from one end of said base and having an opening extending therethrough, a loop retaining section initially extending upwardly and forwardly from said loop receiving section and then downwardly toward an imaginary planar extension of said base, said loop retaining section defining a loop head holding chamber and having a slot formed therein, one end of said slot communicating with the said opening in said loop receiving section, and a leaf spring integrally joined to a portion of said loop retaining section remote from said base, said leaf spring underlying said opening in said loop receiving section and terminating in a free end lying above said opening and within said loop head holding chamber, said leaf spring providing a movable restriction to insertion and withdrawal of a key loop head into and out of said loop head holding chamber through the said opening in said loop receiving section under normal conditions of usage of said retainer.

2. A key loop retainer according to claim **1** including a forward support section integrally joined to the forward, lower end of said loop retaining section and extending rearwardly toward said base.

3. A key loop retainer according to claim **2** wherein said leaf spring is integrally joined to said forward support section adjacent its end proximate said base by a reversely bent bight and said leaf spring extends upwardly from said forward support section in spaced, tensioned, normally divergent relationship with respect to said support section.

4. A key loop retainer according to claim **2** wherein said forward support section is generally coplanar with said base.

5. A key loop retainer according to claim **1** wherein said loop receiving section has a plurality of openings extending therethrough and said loop retaining section has a plurality of slots formed therein and each slot communicates at one end with one of said openings and said leaf spring is continuous throughout its width and underlies each of said openings.

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