Nov. 9, 1971 D. H. HUMPHREY 3,618,346

KEY HOLDER AND KEY

Filed July 22, 1970

Fig. 1

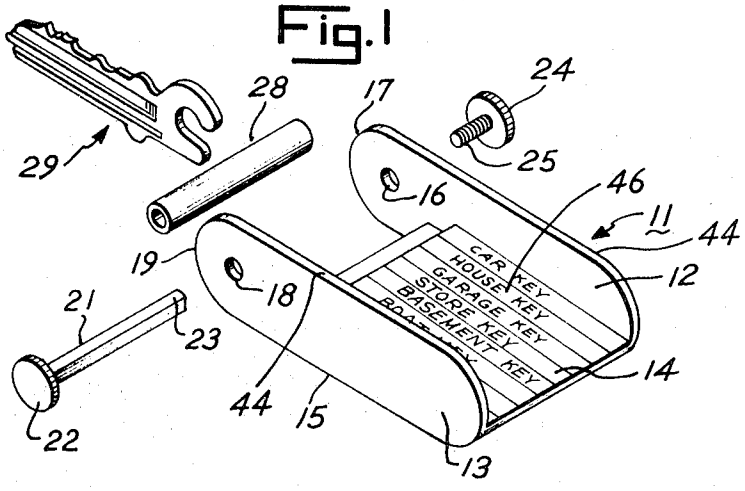


Fig. 2

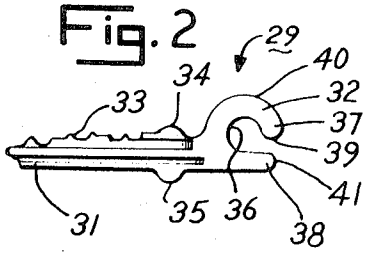


Fig. 5

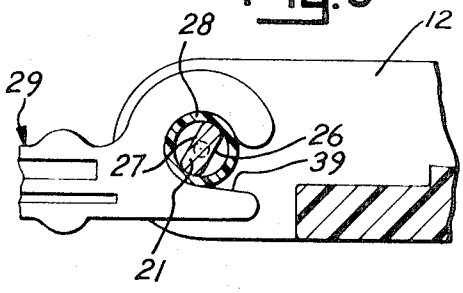


Fig. 3

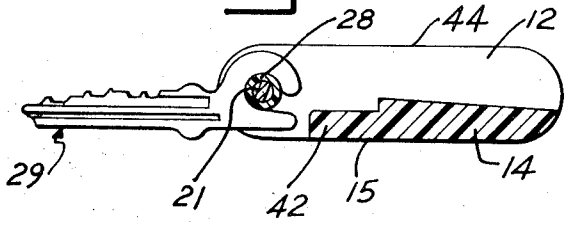


Fig. 6

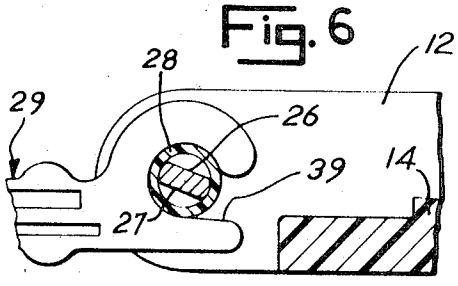


Fig. 4

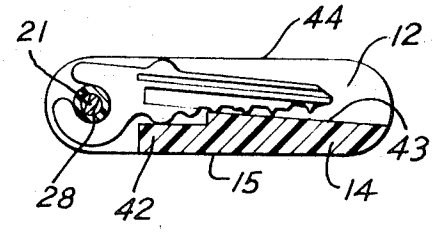


Fig. 7

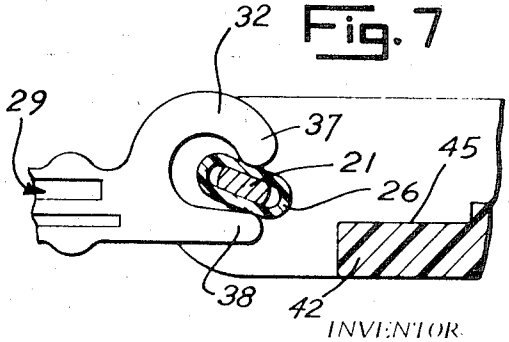
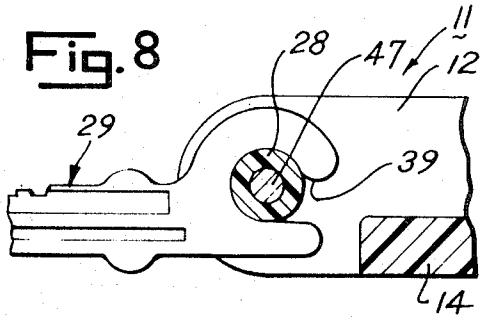


Fig. 8



INVENTOR
DAVID H. HUMPHREY

BY

Molinare Allegretti Newitt & Witcoff

ATTORNEYS

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KEY HOLDER AND KEY

David H. Humphrey, G.P.O. Box 2226,
San Juan, Puerto Rico 00936

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ABSTRACT OF THE DISCLOSURE

An improved key holder and a novel key designed for use with the improved key holder. The novel key includes a conventional shank portion and a head portion having opening means including a hole and a groove therein, with the groove extending from the hole to the outer margin of the head portion and with the width of the narrowest part of the groove being less than the diameter of the hole. The improved key holder includes a resilient tube which extends through the hole in the key when the key is held in the key holder. A bar extends through the tube and normally prevents keys from being added to or removed from the tube because the combined maximum dimension of the bar and tube, even when the tube is radially compressed, is greater than the width of the narrowest part of the groove. However, when it is desired to add or remove a key from the key holder, the bar is withdrawn from the tube to permit the tube to be radially compressed to an extent that the key may be pulled or passed over the tube.

BACKGROUND OF THE INVENTION

This invention relates to an improved key holder and a novel key for use with the improved key holder.

In the past, it has been recognized that for satisfactory commercial acceptance, a key holder should prevent the keys from protruding from the holder so as to protect the lining of the pocket in which the holder is being carried, should permit facile addition to and removal of keys from the holder, should provide a neat, compact and commercially attractive appearance, and should be capable of relatively inexpensive manufacture. The improved key holder of the present invention, in cooperation with the novel key of the present invention, satisfies these requirements in a unique and unobvious manner.

SUMMARY OF THE INVENTION

The novel key of the present invention has a conventional shank portion which is adapted to have teeth formed thereon and a head portion which includes opening means comprising a hole and a groove. The groove connects the hole with the outer margin of the head portion, and the width of the groove, at its narrowest part, is less than the diameter of the hole in the head portion of the key. The improved key holder of the present invention is designed to hold a plurality of these novel keys and includes two end panels with axially aligned holes therein for receiving a transverse bar. A tube of resilient, compressible material is positioned about the bar and extends between the end panels. The bar and tube are arranged so that when the keys are being held by the key holder, the bar and tube extend through the holes in the head portions of the keys. The exterior of the tube is complementary to the interior of the hole in the key and the diameter of the tube may be slightly greater than the diameter of the holes in the head portions of the keys so that the keys cannot rotate freely about the longitudinal axis of the bar and tube.

Individual keys may be easily and quickly added to or removed from the holder by means of a novel key retention arrangement. In the preferred embodiment, the bar has opposed flats formed on the portion thereof which is disposed between the aligned holes in the end panels so that the dimension of the bar, in a plane perpendicular to these flats is substantially less than the width of the narrowest part of the groove formed in the head portion of the key. When the bar is rotated, about its longitudinal axis, to a position where the planes of these flats are parallel to the longitudinal axis of the groove, individual keys can be pulled off or pushed onto the bar and tube since the portion of the tube adjacent to these flats can be compressed so as to permit the bar and tube to be squeezed through the grooves in the keys. When the bar is rotated from this position, keys cannot be pulled off or pushed onto the bar and tube since the combined transverse dimension of the bar and tube, even when the tube is compressed, will be greater than the width of the narrowest part of the groove.

In an alternative key retention arrangement, the bar has a circular cross-section and the bar is removed from the holder, and thus from within the tube, when it is desired to add or remove keys from the holder. In other words, after the bar is removed, a key may be added to or removed from the holder by the simple expedient of pulling or squeezing the unsupported resilient tube through the groove in the head portion of the key.

The improved key holder of the present invention also includes a cross-member which is positioned between the end panels adjacent to their lower margins and which is spaced from the bar. The cross-member and the end panels are arranged so that keys being held by the holder will not project above the plane including the upper margins of the end panels and so that the teeth formed on the shank portion of the keys will be in contact with the upper surface of the cross-member during the time the keys are not being used. This insures that the keys in the holder will never protrude from the holder while the holder is being carried in a pocket. The cross-member also includes a shoulder formed adjacent to the bar, and the shoulder and the upper surface of the cross-member are designed to serve to limit the arc through which the keys may be rotated about the longitudinal axis of the bar.

The improved key holder of the present invention has the additional advantages, from the standpoint of commercialability, of having a relatively compact, neat and commercially attractive appearance and of being capable of being manufactured inexpensively with relatively unskilled labor.

Accordingly, it is a primary object of the present invention to provide an improved key holder and a novel key for use with the improved holder.

Another object of the present invention is to provide a novel key for use with the improved key holder of the present invention wherein the key includes a shank portion adapted to have teeth formed thereon and a head portion having a hole and a groove therein, with the groove extending from the hole to the outer margin of the head portion and with the width of the narrowest part of the groove being less than the maximum dimension of the hole.

Another object of the present invention is to provide an improved key holder wherein a key is held in the holder by means of a resilient tube and a rigid bar which extends through the tube and wherein the key may be easily and quickly added to and removed from the key holder by the simple expedient of moving the bar to a position where it will not prevent the tube from being radially compressed to an extent that the compressed tube may pass through the groove in the head portion of the key.

Still another object of the present invention is to provide an improved key holder wherein when the keys are not in use, they will be retained completely within the holder and wherein the key holder may be inexpensively manufactured by relatively unskilled labor.

These and other objects, advantages and features of the present invention will be more fully set forth in the detailed description which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

In the detailed description which follows, reference will be made to the drawings comprised of the following figures:

FIG. 1 is an exploded, perspective view of an improved key holder and the novel key constructed in accordance with the principles of the present invention;

FIG. 2 is an enlarged, elevation view of a novel key constructed in accordance with the principles of the present invention;

FIG. 3 is a vertical, cross-sectional view of an improved key holder constructed in accordance with the principles of the present invention showing a key in an open position, i.e., a position in which it may be used;

FIG. 4 is a vertical cross-sectional view of an improved key holder constructed in accordance with the principles of the present invention showing a key in a closed position, i.e., positioned within the key holder;

FIG. 5 is a partial vertical, cross-sectional view of an improved key holder constructed in accordance with the principles of the present invention showing the bar utilized to support the resilient tube positioned so that it will prevent removal or the addition of keys from the holder;

FIG. 6 is a partial vertical, cross-sectional view of the improved key holder constructed in accordance with the principles of the present invention showing the bar utilized to support the resilient tube positioned so that it will permit the removal or the addition of keys from the holder;

FIG. 7 is a partial vertical, cross-sectional view of an improved key holder constructed in accordance with the principles of the present invention showing a key being removed from the holder; and

FIG. 8 is a partial vertical, cross-sectional view of an improved key holder constructed in accordance with the principles of the present invention utilizing a bar having a circular cross-section as the support for the resilient tube used in the holder.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown an improved key holder **11** including a pair of end panels **12** and **13** joined by a cross-member **14** that is deposed between the end panels and is secured to the end panels **12** and **13** adjacent to their lower margins **15**. The cross-member **14** is generally rectangular in shape and maintains the end panels **12** and **13** parallel to each other and spaced at a preselected distance from one another. The panel **12** has a hole **16** formed therein adjacent to its end **17** which hole **16** is axially aligned with a hole **18** formed in the end **19** of the panel **13**. The key holder may be fabricated from metal or plastic, and can be made from separate pieces joined together or from a unitary member.

A rigid, transverse bar **21** has a diameter slightly less than the diameter of the holes **16** and **18**, and is longer than the preselected distance between the panels **12** and **13** so that it extends through the holes **16** and **18** in the end panels. A head **22** is integrally formed of one end of the bar **21**. The other end **23** of the bar **21** has an axially internally threaded bore, not shown, formed therein. A cap **24** having a threaded projecting portion **25** integrally formed thereon is adapted to be threaded into the bore formed in the end **23** of the bar **21** in a conventional manner. The outer diameters of the heads **22** and **24** are larger than the diameters of the holes **16** and **18** in the panels **12** and **13** so that when the cap **24** has been threaded onto the end **23**, the bar **21** cannot be moved, relative to the holder, in a direction parallel to the longitudinal axis of the bar, although it may be rotated about its longitudinal axis.

As best shown in FIGS. 5–7, the bar **21** is flattened so as to have two parallel flats **26** and **27** formed thereon. The planes of these flats **26** and **27** are parallel to each other and to the longitudinal axis of the bar **21**. The function of the flats **26** and **27** will be more fully described hereinafter.

A tube **28** is disposed between the end panels **12** and **13** and is made of a resilient, compressible material, such as for example resilient plastic. The bar **21** extends through the tube **28**. The tube **28** has a length equal to the preselected distance between the panels **12** and **13** so that the tube **28** completely surrounds that portion of the bar **21** disposed between the panels **12** and **13** and so that the ends of the tube abut the end panels. The outer diameter of the tube **28** is greater than the diameters of the holes **16** and **18**.

As shown in FIGS. 1 and 2, the novel key **29**, which may be utilized with the holder **11**, includes a shank portion **31** and a head portion **32**. The shank portion **31** is of conventional design and has a plurality of teeth **33** cut on one side thereof, as shown, or if desired, on both sides thereof. Conventional protrusions **34** and **35** are integrally formed as a part of the key **29** between the shank portion **31** and the head portion **32**. These protrusions **34** and **35** are similar to the protrusions typically found on most keys.

The head portion **32** of the key **29** has opening means therein comprising a hole **36** and a groove **39**. The hole **36** may be circular as shown. The diameter of the hole **36** is preferably slightly smaller than the outer diameter of the tube **28** so as to prevent free rotation of the key about the tube due to the compression of the tube by the key when the parts are assembled. The head portion **32** includes shoulders **37** and **38** which define a groove **39** which extends from the hole **36** to the outer margin **40** of the head portion **32**. The end portion of the shoulder **37**, i.e., the portion defining the groove **39**, is smoothly curved so that the groove **39** is of a varying width. The shoulders **37** and **38** are spaced relative to each other so that the width of the narrowest part of the groove **39** in a plane parallel to the plane of the head portion is less than the diameter of the hole **36**. The shoulder **38** has a slightly projecting end portion **41** which, as shown in FIG. 2, is formed on the side of the key opposite from the side of the shank portion **31** that normally has the teeth **33** cut therein for reasons hereinafter described.

As illustrated best in FIGS. 3 and 4, the cross-member **14** has a shoulder **42** which is disposed adjacent to the bar **21** and which is designed so that when a key is mounted on the bar **21** and tube **28** and is disposed in an open position, as in FIG. 3, the end portion **41** of the head portion **32** will abut the shoulder **42**. Thus, the shoulder **42** acts as a stop and limits the arc through which the key **29** may rotate relative to the longitudinal axis of the bar **21**. In other words and with specific reference to FIG. 3, the shoulder **42** prevents further counterclockwise rotation of the key **29** from the position shown in FIG. 3.

The upper surface **43** of the cross-member **14** is recessed below the upper margins **44** of the panels **12** and **13** so that when the key **29** is in a closed position, i.e., in the position illustrated in FIG. 4, no part of the key **29** projects above the plane defined by the top margins **44** of the panels **12** and **13**. Also, as in FIG. 4, the upper surface **45** of the shoulder **42** is disposed a sufficient distance below the surface **43** so as to receive the protrusion **34**.

Another advantage of the improved holder **11**, from the standpoint of commercial appeal, is that the surface **43** of the cross-member **14** may receive labels, such as shown at **46**. These labels **46** can be utilized to identify the keys which are disposed immediately above the label.

As best shown in FIGS. 5–7, the key **29** is held on

the key holder **11** by the novel key retention arrangement comprising the shaft or bar **21** and the tube **28**. More particularly, when the shaft **21** is positioned so that the planes of the flats **26** and **27** are not parallel to the longitudinal axis of the groove **39**, i.e., is positioned for example as in FIG. 5, the key **29** cannot be slipped or pulled off the shaft and tube since the combined diameter or maximum dimension of the shaft and tube is greater than the width of at least the narrowest part of the groove **39**. This will be true even though the sides of the tube **28** may be compressed. However, as illustrated in FIGS. 6 and 7, when the shaft **21** is positioned so that the planes of the flats **26** and **27** are parallel with the axis of the groove **39**, the key can be pulled from or pushed onto the shaft and tube since the tube may be radially compressed, as shown best in FIG. 7, such that the combined dimension of the shaft and tube, in a plane perpendicular to the axis of the groove **39**, is less than the width of the narrowest part of the groove **39**. Thus, the use of the shaft **21**, with the flats **26** and **27** formed thereon, provides an easy and quick means for adding and removing keys from the key holder **11**. Moreover, keys will remain securely held on the key holder unless pulled therefrom even if the shaft inadvertently is moved to the position shown in FIG. 6 since in order to get the keys off the holder, force must be exerted on the key to compress the tube **28**. The key outer diameter could be the same as the hole inner diameter; however, the advantages resulting from compression of the tube **28** upon assembly of the key and tube would be lost.

In FIG. 8, an alternate key retention arrangement is shown which includes a bar **47** which is identical in all respects with the bar **21** except that the portion thereof disposed between the panels **12** and **13** has a circular cross-section, i.e., it does not have flats, such as flats **26** and **27**, formed thereon. Otherwise the key holder **11** and key **29** shown in FIG. 8 are identical, structurally and functionally, to those shown in FIGS. 1 through 7 and described hereinabove. When the shaft **47** extends through the tube **28**, keys cannot be added to or removed from the combined bar and tube since the combined diameter of the bar and tube, even when the tube **28** has been compressed, is greater than the width of the narrowest part of the groove **39**. Keys may be added to or removed from the holder **11** illustrated in FIG. 8 by the simple expedient of removing the bar **47** from the holder **11** and thus from within the tube **28**. Thereafter, a key can be squeezed off or onto the tube **28** since the tube **28** may be relatively easily, radially compressed so that the compressed dimension of the tube will be less than the width of the narrowest part of the groove **39** in the key. After the desired keys have been added to or removed from the holder **11**, the bar **47** is again inserted through the tube **28** and is secured in the holder by threading a cap, similar to the cap **24**, into the projecting end of the bar **47**.

In view of the foregoing, it is apparent that the improved key holder of the present invention provides an improved and unique means for holding the novel keys of the present invention. The improved key holder of the present invention has a clean, compact and commercially attractive appearance and can be manufactured relatively inexpensively by unskilled labor. In addition, the improved key holder is designed to protect pockets and the like from wear resulting from contact with the teeth of the keys. The key holder of the present invention also permits the facile addition or removal of keys from the holder while preventing inadvertent loss or removal of keys from the holder.

It should be noted that while the improved holder **11** of the present invention has been described as having three separate parts, i.e., the end panels **12** and **13** and the cross-member **14**, the holder could be integrally formed. In addition, while the head portion **32** of the novel key of the present invention is different from the generally conventional key, the head portion **32** can be easily cut from a conventional key by, for example, a small hand die cutting press. Further, it will be obvious to those skilled in the art that the bars **21** and **47** could be secured within the holder **11** by means other than cap **24**. Therefore, while the foregoing is a detailed description of the preferred embodiment, it should be understood that all of the present invention embodiments which would be obvious to persons skilled in the art and all those embodiments equivalent to the claimed subject matter are to be included within the scope of the appended claim.

What is claimed is:

1. An improved key holder adapted to hold a plurality of keys, each key having a shank portion adapted to have teeth cut therein and a head portion including a hole and a groove formed therein, with said groove extending from the outer margin of the head portion to said hole and with at least the width of the narrowest part of said groove, in a plane parallel to the plane of the head portion, being less than the maximum inner dimension of said hole, the improved holder comprising; a body including end panels which are spaced apart a preselected distance and which have openings formed therein that are axially aligned; a bar extending through said aligned openings in the end panels, the bar having a length greater than said preselected distance and having at least a portion thereof which has a maximum cross-sectional dimension, in a plane perpendicular to the longitudinal axis of the bar, greater than the width of the narrowest part of said groove in the key; securing means for selectively preventing the bar from being moved parallel to its longitudinal axis relative to the end panels; and a resilient member having a length substantially equal to said preselected distance and being disposed about the bar and between the end panels, the resilient member also being compressible, in a plane perpendicular to its longitudinal axis, so that its compressed maximum dimension is less than said width of the narrowest part of said groove.

2. The improved key holder described in claim **1**, wherein the bar is a solid member having a circular cross-section, in a plane perpendicular to its longitudinal axis; and wherein the resilient member is a tube.

3. The improved key holder described in claim **2**, wherein the securing means can be selectively released so as to permit the bar to be moved parallel to its longitudinal axis relative to the end panels and withdrawn from said openings in the end panels; and wherein the tube has an outer diameter which is greater than the diameter of said openings.

4. The improved key holder described in claim **1**, wherein the resilient member is a tube and wherein the bar has at least one flat formed thereon, with the plane of the flat being generally parallel with the longitudinal axis of the bar; and wherein the bar and the tube, when radially compressed, have a maximum combined cross-sectional dimension, in a plane perpendicular to the plane of the flat, of less than the said width of the narrowest part of said groove.

5. The improved key holder described in claim **4**, wherein the ends of the tube contact the sides of the end panels so as to prevent movement of the tube relative to the end panels; and wherein the maximum cross-sectional dimension of the tube, in a plane perpendicular to the longitudinal axis of the bar, is slightly greater than the maximum dimension of the hole in the key whereby as a result of the compression of the tube by a key, the key will be prevented from freely rotating about the longitudinal axis of the bar.

6. The improved key holder described in claim **1**, wherein the holder includes a cross-member positioned between the end panels and spaced from the bar, the cross-member having a shoulder thereon adjacent to the bar, which shoulder is positioned so as to limit the arc through

which keys held in the holders may rotate about the longitudinal axis of the bar.

7. The improved key holder described in claim 6, wherein the resilient member is a tube and wherein the bar has at least one flat formed thereon, with the plane of the flat being generally parallel with the longitudinal axis of the bar; wherein the bar and the tube, when radially compressed, have a maximum combined cross-sectional dimension, in a plane perpendicular to the plane of the flat, of less than the said width of the narrowest part of said groove; wherein the ends of the tube contact the sides of the end panels so as to prevent movement of the tube relative to the end panels; and wherein the combined maximum cross-sectional dimension of the bar and the tube, in a plane perpendicular to the longitudinal axis of the bar, is slightly greater than the maximum dimension of the hole in the key whereby as a result of the compression of the tube by a key, the key will be prevented from freely rotating about the longitudinal axis of the bar.

8. A key adapted to be held in an improved key holder which includes a bar surrounded by a compressibly resilient member, the bar and resilient member having a maximum cross-sectional dimension of a first preselected width and a minimum cross-sectional dimension of a second smaller width, the key comprising: a shank portion adapted to have teeth cut therein and a head portion including opening means comprising a hole and a groove, said groove extending from the outer margin of the head portion to said hole and having a minimum width, in a plane parallel to the plane of the head portion, of less than the diameter of said hole, with the width of the narrowest part of the groove being greater than the second smaller width of the combined bar and resilient member but less than the first preselected width of the combined bar and resilient member.

9. A key as described in claim 8, wherein the resilient member is tubular and the hole is circular and has a diameter slightly less than the diameter of the resilient member, whereby the key is prevented from rotating freely about the longitudinal axis of the resilient member.

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ROBERT L. WOLFE, Primary Examiner

U.S. Cl. X.R.

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