United States Patent

Chow et al.

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[54] **KEY CASE**

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

[58] **Field of Search** ..... 70/456–459; 150/40; 24/3 K

[56] **References Cited**

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Primary Examiner—Robert L. Wolfe

[57] **ABSTRACT**

A convenient key case having one or more pockets structured to have a non-removable but rotatable holding means for each pocket to hold a key having a head and a body and to move a desired key to a load, store or use position. An adaptor is adhered to the head of the key to maintain a desired relationship with the holding means disregarding the shape of the head. At the load position the key is easily and quickly inserted in or removed from the holding means. At the store position the key is properly stored in the pocket of the case. At the use position the body of the key is exposed at a proper position with ability to swing and a part of the head always remains inside the pocket and non-detachable from the holding means.

14 Claims, 10 Drawing Figures

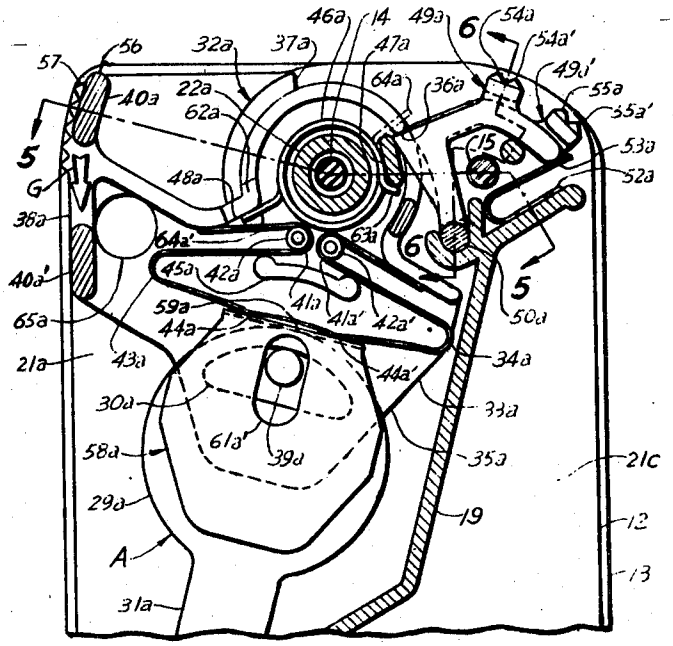


Fig. 10

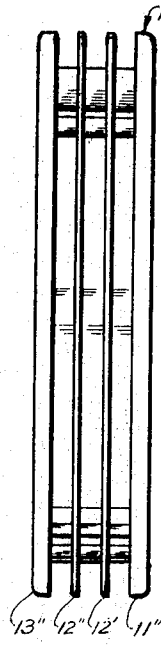


Fig. 9



Fig. 2

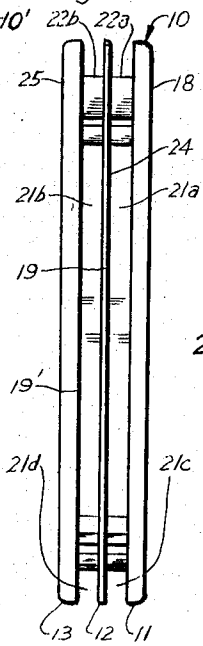


Fig. 1

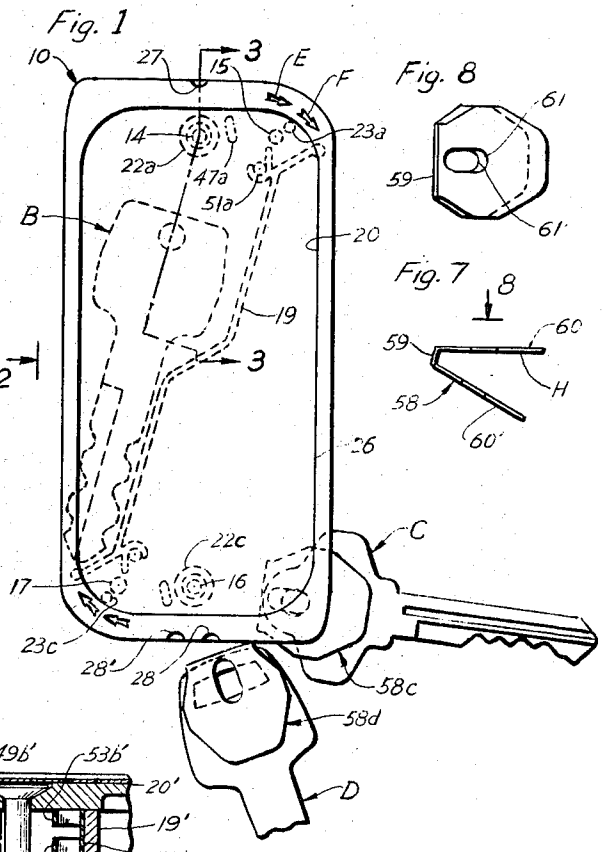


Fig. 8

Fig. 7

Fig. 5

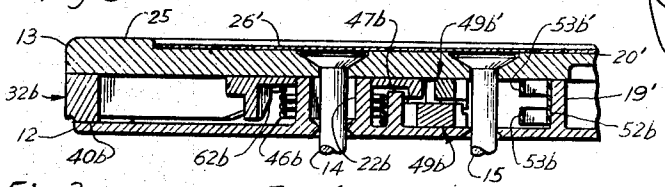


Fig. 3

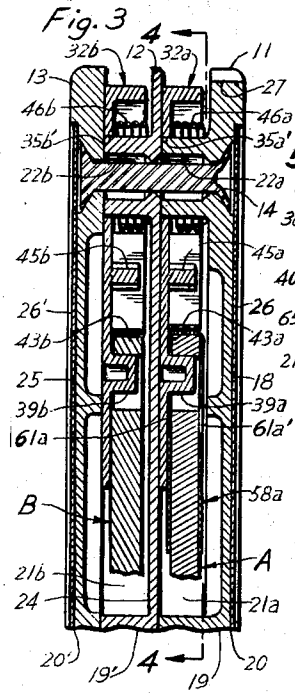


Fig. 4

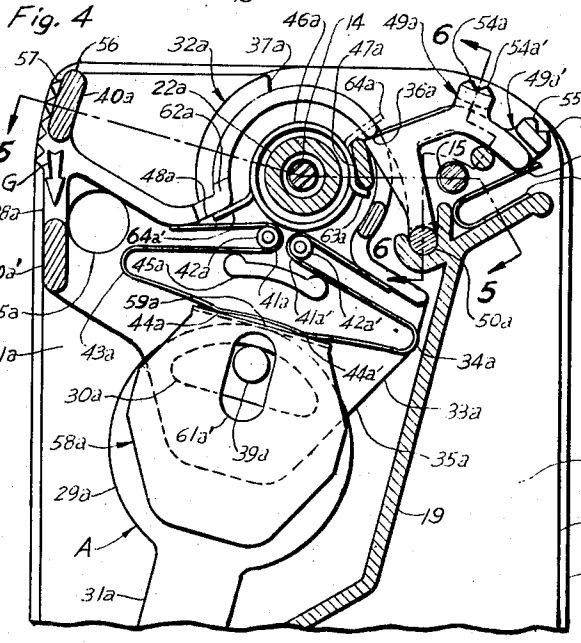
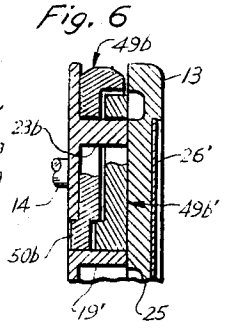


Fig. 6



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KEY CASE

CROSS-REFERENCE TO RELATED APPLICATION

The key case for instantly selecting a desired key to engage a lock which is shown and described in the instant application for purpose of illustration, but not limitation, is an improvement over those shown in copending application Ser. No. 857,860, filed Sept. 15, 1969 now U.S. Pat. No. 3,599,458.

BACKGROUND OF THE INVENTION

This invention relates to a key case and more particularly to a case for conveniently and quickly move one desired key to a proper load, store or use position, by the maneuver of one hand at ease and to assure the proper orientation of the key in its use position ready to engage a lock. Most key cases presently in use are inconvenient and time-consuming to find and orient the right key for engaging a lock and return the key to its case and especially difficult to insert or remove the key in or from the case.

SUMMARY OF THE INVENTION

According to this invention, a key case includes a housing provided with one or more pockets of the same construction. Each pocket has enough space to store a key which has a head with a hole and a body. An adaptor is adhered to the head to form a flat end and a limited hole size in the head. A holding means in each pocket non-removable but rotatable from the housing has a swing with a button engaged with the hole as limited by the adaptor and a holding spring in engaging with the flat end of the adaptor and capable to move the key to a load, store or use position. At the load position the key is easily and quickly inserted in or removed from the holding means. At the store position the key is properly kept inside the pocket of the housing. At the use position the body of the key is exposed properly from the pocket with ability to swing and a part of the head always remains inside the pocket and is unable to detach from the holding means. The adaptor is not needed for a key having a flat end and a round hole which is slightly larger than the button on the swing of the holding means. A key as stated above represents a tool of the similar configuration, such as a screw driver, knife, feeler gage and can opener.

It is the objective of the present invention to provide a simple, light, sturdy and compact key case which is inexpensive in that it is constructed out of easily produced parts and provides convenient and quick means to insert or remove a key in or from the case, to select a desired key for engaging a lock and to return the key into the case to store in orderly form for its next use.

Another object of this invention is to have the key case to accept almost all flat keys for homes, offices and automobiles.

Another object of this invention is to have one hand maneuver to move a key in each pocket of the case to any one of the three positions and engage a desired key with a lock.

Another object of this invention is to provide an automatic ejecting device associated with the holding means to move a key from its store to use position automatically at the releasing of a control means, which

normally holds the key in its store position upon its return from other positions.

Another object of this invention is to provide an automatic moving device associated with the holding means to move a key from its use to load position automatically at the releasing of another control means, which normally holds the key in its use position.

Another object of this invention is to provide a module design in order to have common parts for key cases with multiple keys in any number.

Another object of this invention is to arrange the same control means for different keys next to each other, but individually operable to select a desired key.

Another object of this invention is to rigidize each pocket in avoiding dimensional change or functional faults by providing continuous ribs, heavy walls and multiple fastening points, using rigid yet light material and depending on the holding means to support the walls of the pocket.

Another object of this invention is to design the spring member in the holding means in engaging with the flat end of the head or the adaptor allowing the key to insert in or remove from the holding means quickly and easily at the load position, to swing freely at the use position for avoiding any interference between the key case and any object during the turning of the key in engaging with a lock, and to cause no rattling noise upon shaking at the store position. The key is also able to engage a lock at its load position in the key case, when there is very little space around the lock.

Another object of this invention is to provide a visible and distinctive shape which is sensible by a finger in darkness for each group of pockets at the same side.

A further object of this invention is to provide a hole in the holding means which is exposed in the use position in order to allow the key case being hung on a hook or a nail for storage purpose.

A further object of this invention is to have two panels allowing ample spaces for designs, pictures, charts, slogans and figures to suit every marketing requirement.

A further object of this invention is to have a torsion spring for automatic ejection of the holding means and being easily assembled between the housing and the holding means.

A further object of this invention is to provide a simple leaf spring to hold both control means against the holding means and being easily assembled.

A still further object of this invention is to remove a key from the key case while another key is inserted in a lock engaged with the case or disengage a key inserted in a lock from the case which contains the other keys by one hand maneuver. This is a very important characteristic besides its convenience in selecting a desired key to engage a lock.

To the accomplishment of the foregoing objects and such other objects as may hereinafter appear, the present invention relates to the key case above referred to as defined in the appended claims and as described in the following specification taken together with the accompanying drawings, in which:

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a four-pocket key case showing key B in its store position, key C in its use position

and key D in its load position according to this invention;

FIG. 2 is a side view, showing the housing only, looking in the direction of the arrow 2 of FIG. 1;

FIG. 3 is a cross-sectional view, on an enlarged scale, taken along the line 3—3 of FIG. 1 showing keys A and B in their store positions;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3 showing all components in a pocket for key A;

FIG. 5 is a partial cross-sectional view taken along the line 5—5 of FIG. 4;

FIG. 6 is a partial cross-sectional view taken along the line 6—6 of FIG. 4;

FIG. 7 is a side view of a key adaptor according to this invention;

FIG. 8 is a plan view of the key adaptor looking in the direction of the arrow 8 of FIG. 7;

FIG. 9 is a side view of a two-pocket key case, showing the housing only, according to this invention; and

FIG. 10 is a side view of a six-pocket key case, showing the housing only, according to this invention.

DETAILED DESCRIPTION OF THE INVENTION

In the drawing, FIGS. 1 to 8 show a 4-pocket key case constructed with a housing 10 having an outer case 11, an inner case 12, a cover 13 and four rivets 14, 15, 16 and 17. The outer case has a wall 18, a partition 19 and a recess 20 in the wall 18. The partition 19 separates two pockets 21*a* and 21*c*. In both pockets, hollow cylinders 22*a* and 22*c*, posts 23*a* and 23*c* are provided on the wall 18 at the same height as the partition 19. The inner case 12 has a wall 24 and the identical partition 19', hollow cylinders 22*b* and 22*d* and posts 23*b* and 23*d* formed on the wall 24. The partition 19' separates two pockets 21*b* and 21*d*. The cover 13 has a wall 25 and a recess 20' which has the same shape as the recess 20. The rivets 14, 15, 16 and 17 with heads fitted in the walls 18 and 25 hold the outer case 11, the inner case 12 and the cover 13 together and create those pockets 21*a*, 21*b*, 21*c* and 21*d* for four keys A, B, C and D respectively. Decorative labels 26 and 26' are adhered to the walls 18 and 25 in the recesses 20 and 20' to cover up the heads of the rivets. Those labels form two panels allowing ample spaces for designs, pictures, charts, slogans and figures to suit every marketing requirement. One notch 27 is formed in the wall 18 at one side to identify pockets for keys A and B. Two notches 28 and 28' are formed in the same wall 18 at the other side to identify pockets for keys C and D. These notches are sensible with a finger in order to select a desired key in darkness. Keys A, B, C and D are inside these pockets 21*a*, 21*b*, 21*c* and 21*d* respectively within the walls 18 and 25. The wall 24 of the inner case is slightly smaller than the wall 18 or 25 at certain areas as shown in FIG. 4. The key A in the pocket 21*a* has a head 29*a* with an opening 30*a* and a body 31*a* as shown in FIG. 4. The key B as shown in FIG. 1 has a longest body which will fit in the pocket. The keys A, B, C and D as shown in FIGS. 1 and 4 have various shapes of their heads and openings in the heads.

Each identical pocket for each key has a holding means 32*a* or 32*b* for pockets 21*a* or 21*b* as shown in FIGS. 3, 4 and 5 in its store position. The holding means 32*a* has a swing 33*a* and a spring member 34*a*. The swing 33*a* has a plate 35*a* with a hole 35*a*' fitted on the hollow cylinder 22*a* enabling the holding means 32*a* to rotate in the pocket 21*a* about a fixed center point and preventing the holding means 32*a* to separate from the housing 10. The swing 33*a* has a first stop 36*a*, a second stop 37*a*, at different level from the first stop 36*a*, a rim 38*a* and a button 39*a*. The rim 38*a* has two pads 40*a* and 40*a*'. The thickness of the swing 33*a* at these two pads 40*a* and 40*a*' is just slightly less than the height of the space provided between the walls 18 and 24. This provision will prevent the walls 18 and 24 from closing to each other, while the swing 32*a* is in its store position. The spring member 34*a* is a flat spring formed to provide hook ends 41*a* and 41*a*' engaging with two pins 42*a* and 42*a*' provided on the plate 35*a* of the swing 33*a* and a deformable loop 43*a* which forms two bumps 44*a* and 44*a*' to engage with the head of the key A. When the key A is not present, the loop 43*a* is pressed against the button 39*a* which has a height less than the spring member 34*a*. The maximum movement of the loop 43*a* is limited by the stopper 45*a*.

A torsion spring 46*a* is provided between a web 47*a* formed on the wall 18 of the outer case 11 and a shoulder 48*a* on the swing 33*a* to urge the holding means 32*a* to rotate clockwise as viewed in FIG. 4 around the hollow cylinder 22*a*.

In order to hold the holding means 32*a* with the key A in its store position a first control means 49*a* is introduced between the partition 19 of the outer case 11 and the first stop 36*a*. The first control means 49*a* is rotatable about a pivot 50*a* which engages in a hole 51*a* formed in the wall 18 of the outer case 11. A U-shaped spring 52*a* has one end split with two leaves 53*a* and 53*a*' is provided between the partition 19 and the control means. The leaf 53*a* urges the first control means 49*a* to contact with the web 47*a*. By a sliding action with a finger at the teeth 54*a* and 54*a*' in the direction of the arrow E as formed on the outer case 11 and shown in FIG. 1 against the leaf 53*a*, the first control means 49*a* will disengage with the first stop 36*a* and the holding means 32*a* will rotate as urged by the torsion spring 46*a* out of its store position.

A second control means 49*a*' is introduced to stop the rotation of the holding means 32*a* to an use position, when the second stop 37*a* is in contact with the second control means 49*a*'. The two control means 49*a* and 49*a*' are held in position except rotation. The leaf 53*a*' urges the second control means 49*a*' to assure the holding means 32*a* staying in its use position and allow the holding means 32*a* rotatable towards its store position. By sliding action with a finger at the teeth 55*a* and 55*a*' in the direction of the arrow F as formed on the outer case 11 and shown in FIG. 1 against the leaf 53*a*', the second control means 49*a*' will disengage with the second stop 37*a* and the holding means 32*a* will rotate to its load position as urged by the torsion spring 46*a*.

At this load position, the button 39*a* and the loop 43*a* will be exposed or uncovered from the wall 18 of the outer case 11. The key D as shown in FIG. 1 is illustrated in its load position. Therefore, a key is able to be loaded by pushing the loop 43*a* with the head 29*a* until the opening 30*a* is engaged with the button 39*a*. The spring member 34*a* always urges the key A in connection with the button 39*a* of the holding means 32*a*. This holding force prevents rattling noise of the key in its

store position upon shaking. At this load position, the key is able to be easily and quickly removed. If a lock is located in a very tight space, the key A in this load position is able to be used to engage the lock by holding the key head **29***a* and the holding means **32***a* together to turn the key A.

Upon turning the holding means **32***a* in the direction of the arrow G as formed on the swing **33***a* and shown in FIG. **4** against the torsion spring **46***a* at a tip **56** or teeth **57** of the swing **33***a*, the holding means **32***a* will be moved from the load to use position, the use to store position or the load to store position as desired.

The part designations for the key B in the pocket **21***b* as shown in FIGS. **3**, **5** and **6** are identical to the key A in the pocket **21***a* by changing the suffix letter from *a* to *b*.

At the use position, as illustrated by the key C in FIG. **1**, a part of the key head and a part of the holding means including the button are enclosed within the boundary of the housing to prevent the removal of the key from the holding means or the housing, while the body of the key is completely exposed for its engagement with a lock.

Due to the shape of the loop of the spring member in the holding means, the key is rotatable about the button to prevent any interference of the housing with an object near a lock which is engaged with the key for turning.

It is desirable to have as much contact as possible between the walls of the cases or cover and the head of the key in its use position in order to transmit the turning torque from the housing to the head of a key in engaging with a lock by holding the housing with fingers at the walls of the outer case and the cover. For the same reason, the housing at these corners in engaging with key head is provided with heavy wall and the rim is provided at the swing to rigidize the housing.

It is also desirable to maintain a definite relative position between the holding means and the key at any one of its three positions, especially at its store position. A key adaptor **58** as shown in FIGS. **7** and **8** is introduced. It has a flat end **59**, two plates **60** and **60'** to form a U-shape and two slots **61** and **61'** in the plates **60** and **60'** respectively. This key adaptor is made from a thin material, such as aluminum alloy and plastic, coated with an adhesive on the whole inside surface H and covered with a removable lining sheet. These slots **61** and **61'** are slightly wider than the size of the button **39***a* on the swing **33***a* of the holding means **32***a*. Upon the removal of the lining material or sheet, the key adaptors as shown by **58***a*, **58***c* and **58***d* are pressed and adhered on the heads of keys A, C and D respectively as shown in FIGS. **1**, **3** and **4**. The flat end **59***a* of the key adaptor **58***a* will be in contact with the pumps **44***a* and **44***a'* on the loop **43***a* of the spring member **34***a* to maintain a proper position of the key A with respect to the holding means **32***a* and to allow the key A to swing on the button **39***a* when necessary. The slot **61***a* in the key adaptor **58***a* will prevent the sliding of the key head **29***a* having the elongated hole **30***a* on the button **39***a*.

The key adaptor is made symmetrical in shape so that the key upon loading on the holding means will have its teeth properly oriented at its use position ready for engaging a lock without guessing.

A key as represented by the key B shown in FIGS. **1** and **3** does not require a key adaptor. However, a key adaptor applied to this key will not affect its function.

If a key has a very thin head, a number of key adaptors are applied to build up its thickness to prevent its looseness inside the pocket.

In order to facilitate assembling of the torsion spring **46***a*, the web **47***a* on the outer case **11** and a sloped surface **62***a* on the swing **33***a* are provided. Before the holding means **32***a* is assembled to the hollow cylinder **22***a*, the torsion spring **46***a* is placed over the cylinder **22***a* with one leg **63***a* and the other leg **64***a* straddled over the web **47***a* under a pretorsion to close the two legs. The holding means **32***a* is then assembled at its load position. The sloped surface **62***a* will automatically move the leg **64***a* away from the web **47***a* and engage with the surface **48***a* to create a torsional force to rotate the swing **33***a* in a clockwise direction as seen in FIG. **4**. It is important to save labor cost in assembling a torsion spring and enable the adaption of automation.

A hole **65***a*, provided in the swing **33***a*, enables the key case to hang on a hook or a nail at any one holding means at its use position.

FIG. **9** shows a key case of this invention with two pockets for two keys. An outer case **11'**, and a cover **13'**, identical to the outer case **11** and the cover **13**, and four shorter rivets will form a housing for two pockets. The components needed for each pocket are the same as shown in FIGS. **3** and **4** and described above and are not shown in FIG. **9**.

FIG. **10** shows a key case of this invention with six pockets for six keys. An outer case **11''**, two inner cases **12'** and **12''**, a cover **13''**, identical to the outer case **11**, the inner case **12** and the cover **13**, and four longer rivets will form a housing for six pockets. The parts needed for each pocket are the same as described in the above.

From the above description and the showing of the drawings, our invention related to key and tool cases provides "load," "store" and "use" positions for each key or tool and the number of keys or tools in each case is not limited to two, four or six as illustrated above.

It will be understood, of course, that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted herein otherwise than necessitated by the scope of the appended claims.

We claim:

1. A key case comprising a housing having at least one pocket each said pocket having enough space to store a key, said key having a head with an aperture and a body, a key adaptor adhered to the head of said key to form a flat end and limit the size of said aperture, and a holding means in each said pocket non-removable but rotatable from said housing having a swing with a button engaged with said aperture as limited by said key adaptor and a holding spring to engage the flat end of said key adaptor and capable to move said key to any one of three positions, namely; load, store and use position, at said load position having said key easily inserted in and removed from said holding means, at said store position having said key kept properly inside said pocket, and at said use position having said body of said key completely exposed from said pocket at a proper

position with ability to swing and having a part of said head and said button inside said pocket and non-detachable from said key case.

2. The key case of claim 1 in which said holding means is maneuverable with one hand to move said key to any one of three said positions.

3. The key case of claim 1 in which at least one key is removable from said key case with one hand while another key in its use position is being engaged in a lock.

4. The key case of claim 1 in which one key in its use position engaged in a lock is able to be moved to its load position for detaching said key case with other keys from said key engaged in said lock by the maneuvering of one hand.

5. The key case of claim 1 in which said swing has a hole enabling said key case to hang on a hook for storaging purpose at any one of said holding means at its use position.

6. The key case of claim 1 in which said housing consists of an outer case, a cover and a number of inner cases depending on the number of said pockets to be formed and said cases and cover are held together to contain said holding means.

7. The key case of claim 1 in which said key adaptor has two thin plates adjacent to said flat end to form a U-shape and one slot in each said plate.

8. The key case of claim 1 in which said swing has a spring member to eject said key from said store position to said use position upon the releasing of a first control means in association with said swing, and said swing in said use position is held by a second control means and said spring member.

9. The key case of claim 8 in which said spring member ejects said key from said use position to said load position upon the releasing of said second control means in association with said swing, and said swing in said load position is held by said spring member.

10. The key case of claim 9 in which said first and second control means for pockets at the same side of said housing are located next to each other.

11. The key case of claim 10 in which said housing has a visible and distinctive shape sensible by a finger for said pockets at the same side of said housing for selecting the desired key in darkness.

12. The key case of claim 8 in which said spring member is a torsion spring which is automatically engaged between said swing and said housing upon the assembling of said holding means to said housing at said load position.

13. The key case of claim 9 in which a leaf spring provided to hold said first and second control means against said swing.

14. The key case of claim 9 in which said housing has two uninterrupted panels with ample space to satisfy various marketing requirements.

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