Jan. 22, 1957 N. J. DUYN 2,778,217

KEY CASE

Filed March 19, 1956

FIG. 1.

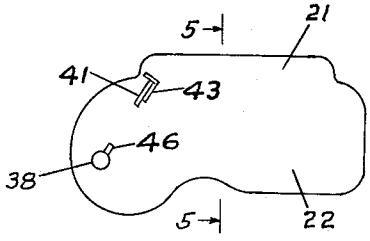


FIG. 2.

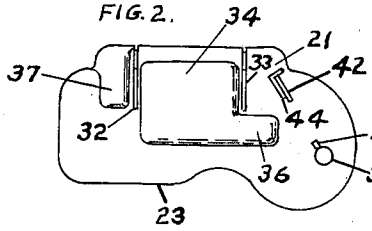


FIG. 5.

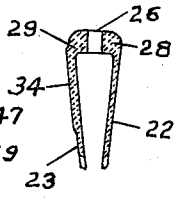


FIG. 3.

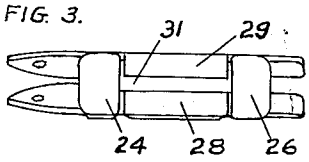


FIG. 4.

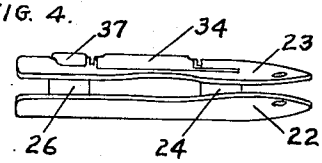


FIG. 7.

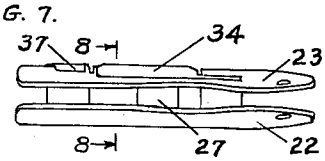


FIG. 6.

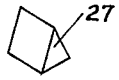


FIG. 8.

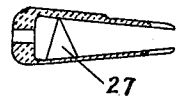


FIG. 9.

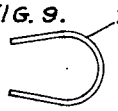


FIG. 13.

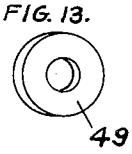


FIG. 11.

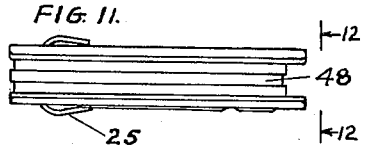


FIG. 12.

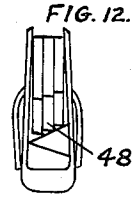


FIG. 14.

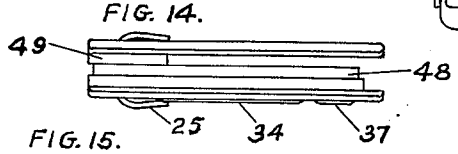


FIG. 10.

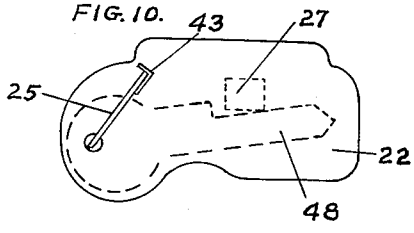


FIG. 15.

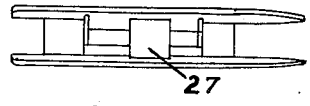


FIG. 18.

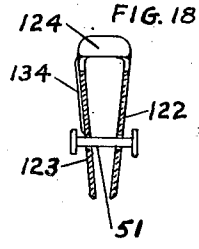


FIG. 16.

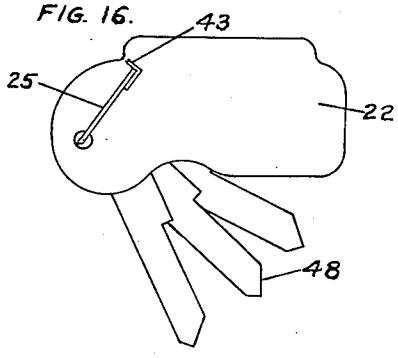
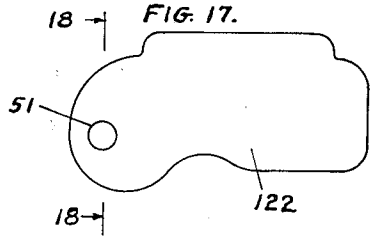


FIG. 17.



NICK J. DUYN, INVENTOR.

BY John J. McLaughlin

United States Patent Office 2,778,217
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2,778,217

KEY CASE

Nick J. Duyn, Tucson, Ariz.

Application March 19, 1956, Serial No. 572,414

4 Claims. (Cl. 70—456)

My invention relates in general to key cases. It relates more in particular to an improved, functionally advanced key case embodying the general features of my prior Patent No. 2,467,614, dated April 19, 1949, particularly adapted to be formed from suitable thermo-plastic material.

The principal object of my invention is the provision of an inexpensive key case within which a predetermined, relatively small number of keys may be completely housed, but from which they may be quickly and readily released for use.

A further object is to produce a plastic key case in which keys are retained frictionally between a pair of plates comprising an integral plastic body, and in which finger pressure on the plastic body is adequate to release the keys.

A still further object is the provision of a key case according to the preceding object, and in which the integral plastic body is relieved and reinforced in such a manner as to cause the plates to move with relation to each other substantially without warping.

Other specific objects and features of the invention will be made apparent by reference to the following detailed description taken with the accompanying drawings, wherein,

Fig. 1 is a front elevational view of a partially completed case body as it is received from an injection mold and before insertion of an actuating fulcrum;

Fig. 2 is a similar view in rear elevation;

Fig. 3 is a top plan view of the Fig. 1 body portion;

Fig. 4 is a bottom plan view showing the extreme convergence of the front and rear plates;

Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is an isometric view showing the actuating fulcrum before its insertion in the body portion;

Fig. 7 is a bottom plan view, similar to Fig. 4, but showing the fulcrum in place;

Fig. 8 is a transverse sectional view taken on the line 8—8 of Fig. 7;

Fig. 9 is an elevational view showing a preferred form of retainer for pivotally holding keys within the case;

Fig. 10 is an elevational view, similar to Fig. 1, but showing the completely assembled key case, with the position of the keys shown in broken lines;

Fig. 11 is a bottom plan view of Fig. 10;

Fig. 12 is an end view looking along the line 12—12 of Fig. 11;

Fig. 13 is a perspective view of a filler which may be used to replace a key;

Fig. 14 is a bottom plan view, similar to Fig. 11, but showing the manner of using the filler shown in Fig. 13;

Fig. 15 is a bottom plan view, similar to Fig. 7, but illustrating the position of the front and rear plates when the key case body is suitably pressed between the thumb and fingers;

Fig. 16 is an elevational view, similar to Fig. 10, but illustrating the manner in which the keys are released

and drop by gravity bias when the key case is pressed to assume the configuration illustrated in Fig. 15;

Fig. 17 is a front elevational view showing a modified form of key retainer; and

Fig. 18 is a transverse sectional view taken on the line 18—18 of Fig. 17.

Referring now to the drawings, the key case of my invention comprises an integral body portion, generally indicated by the reference character 21 and having as its principal integral components a front plate 22 and rear plate 23 connected together at the top by thickened web portions 24 and 26. Secured to the front plate 22, in a manner which will be described, is a wedge-shaped actuating fulcrum 27 (Fig. 6) so that pressing the plates together above the fulcrum will cause the rear plate 23 to tilt around the fulcrum and create relative separating movement between the plates 22 and 23 in such a manner as to provide a functional result as will be more clearly described hereinbelow. Keys are preferably retained between the plates 22 and 23 by a spring clip, generally horse-shoe shaped retainer 25 as shown in elevation in Fig. 9.

Some of the detail structural features are most clearly shown in Figs. 1 through 5 illustrating the body portion as it is received from a mold. As shown particularly in Fig. 5, the plates 22 and 23 have thickened portions 28 and 29, respectively, forming continuous heads between the web portions 24 and 26. These thickened portions or heads 28 and 29 are separated by a space 31 (Fig. 3) so that they can be grasped between the thumb and fingers and brought together. Kerfs 32 and 33 formed at the top portion of rear plate 23 at the inner boundaries of the web portions 24 and 26 form a relieved rectangular tab 34 which permits bringing the thickened portions 28 and 29 together throughout their entire length. As appears clear, particularly in Figs. 2 through 5, the tab 34 is thickened for reinforcement and this thickening extends at 36 toward a rounded offset extension of rear plate 23, which functions to hold the head portions of keys. In this connection it will be noted that in outline the plates 22 and 23 are identical, each comprising a generally rectangular portion in which shanks of retained keys are housed, and a rounded offset portion for receiving the key heads. In addition to the reinforced portions previously described, rear plate 23 also is provided with a reinforcing integral tab 37 running downwardly from its top edge adjacent kerf 32 and spaced from the rectangular tab 34.

Referring further to Figs. 1–5, the body portion is initially molded so that the two plates 22 and 23 slope downwardly toward each other almost into contact as shown in Fig. 5. Holes 38 and 39 are also molded in the plates 22 and 23, respectively, for receiving a key-retaining member. Immediately below web 24 there are also molded shallow elongated recesses 41 and 42 bounded inwardly from side edges of the plates by raised angular stops 43 and 44. The elongated recesses 41 and 42, respectively, are directly in line with the center of holes 38 and 39, and adjacent such holes are further recesses 46 and 47 aligned with the recesses 41 and 42.

I have found it possible to mold the body portion as shown in Figs. 1–5 in a single operation so that no finishing forming operation of any kind is required. This materially decreases the total cost of producing the finished key case. When the body portion as shown in Figs. 1–5 has been received from the mold, the fulcrum 27 is suitably attached to the front plate 22 by plastic welding. This is simply done by applying a solvent to its base and inserting it in proper location between the plates 22 and 23 while they are sprung apart. I have found that by use of a simple fixture or jig, this operation may be carried out very quickly and accurately,

it being obvious that when the separated plates **22** and **23** are released, plate **23** rides on the apex of the wedge-shaped fulcrum and will hold it in position until the solvent evaporates and the weld sets firmly. Insertion of the fulcrum causes the bottom edges of the plates **22** and **23** to be held slightly more separated than as received from the mold, as may be seen by comparison of Figs. 3–5 with Figs. 7 and 8 showing the fulcrum in place. Thus, in effect, the body portion, including the fulcrum, becomes an integral unit, and the plate **23** is always in contact with the apex of the fulcrum.

To insert keys in the case, their heads are placed between the rounded offset portions of the plates **22** and **23** with the usual holes in such heads in line with the holes **38** and **39** in the plates. Figs. 10, 11, 14 and 16 show heads of keys **48** in such position. One end of the retainer **25** is then threaded through the aligned holes, its bight moved to key-retaining position, and the ends of the retainer moved rotatably until they snap into and are retained by the recesses **41** and **42**.

For best results, the key case of my invention should contain the specific number of keys for which it was designed. As shown in the drawings, it is designed to hold three keys, commonly the number which one may carry in his pocket and to which he requires quick and frequent access. If less than such number are to be carried, however, one may use one or more spacers **49** in the form of a fibre washer or washers, as shown in Fig. 13. Fig. 14 shows the key case described hereinabove carrying two keys **48** and a single spacer **49**.

Figs. 17 and 18 show a modification in which a small nut and bolt **51**, or similar straight-shank retainer, is substituted for the horse-shoe shaped retainer **25**. Since the retainer takes no part in providing for the resilient action of the plates **22** and **23**, a straight shank retainer will functionally replace the horse-shoe type retainer **27** in all respects. It will be noted, however, that the head of the bolt and its nut are spaced slightly from the front and rear plates to permit their moving functionally with respect to each other in the required manner. It should also be noted that the stops **43** and **44**, and recesses **41**, **42**, **46** and **47** are not required when the nut and bolt **51** are used. In all other respects, however, the key case is unchanged. I therefore have applied the same reference characters to Figs. 17 and 18 as are used in the main embodiment, preceded with the prefix **1**, however, to denote modification.

In the above detailed description of the structure of my key case, I have used identifying reference expressions such as front, rear, top, bottom, etc.; but it should be understood that such terms are used for purposes of description and are not used in a limiting manner. These same types of expressions will be used in identifying functional characteristics as described below. It should be understood, however, that since my present invention does not employ spring means to eject the key shanks when the front and rear plates are moved away from them, but depends on the biasing action of gravity, it is essential to hold the key case in the position shown in Fig. 16 to release the key shanks in the intended manner.

As previously noted, the body portion as initially molded provides for the maximum converging of the plates **22** and **23** so that they almost touch at the bottom (Fig. 5). The insertion of the wedge-shaped fulcrum **27** separates the plates slightly further at the bottom edge, but still leaves them normally in sharp converging relation along their entire length, including the rounded, offset portion which clamps the key heads together as they are retained by the retainer **27**. Thus it will be seen that when the keys are placed within the key case, their heads are clamped together, and the shanks are held between the fulcrum and the sloping sides of the plates, as shown particularly in Fig. 12.

As explained, the keys are released by pressing the top edges of the plates, along the heads **28** and **29** to force the rear plate to pivot around the apex of the fulcrum. This closes the top opening **31** and causes the plates to assume the somewhat diverging position shown in the bottom plan Fig. 15. This action is made possible by the detailed construction described. The front plate **22**, being continuous and of uniform thickness, acts as a base for the fulcrum and is not deformed in any way by the described squeezing or pressing action. The fulcrum, it will be noted, is substantially midway between the kerfs and about two-thirds of the distance between the tops of the kerfs and their bottoms. The kerfs **32** and **33** relieve the back plate so that the tab **34** can freely rock about the fulcrum. The tab **34**, being reinforced, does not bend but functions as a unit carrying the bottom thinner portion immediately below it so that this middle portion is caused to have diverging movement without warping or distortion. The thickened extension **36** running from the tab portion toward the key head-retaining rounded offset portion causes this portion of the rear plate to follow the movement of the center portion with, however, some warping action below the web **24**. A similar warping action takes place in that portion of the rear plate **23** to the left of (Fig. 2) and below the web **26**. The result is that, so far as the key clamping portion of the body is concerned, plate **23** moves as a unit in the manner indicated in Fig. 15. The recesses **46** and **47** allow the offset portions of the plates to expand evenly as a unit without binding against rounded side edges of the retainer **25**. Notwithstanding the action of the plates in expanding as units in the manner described, the bottom edges of the plates **22** and **23** are sufficiently flexible so that keys may be reinserted by merely forcing them into closed or housed position with the fingers, no actuation around the fulcrum, as in releasing the keys, being necessary.

The use of the key case of my invention is the same whether it contains its total complement of keys, or if a spacer or spacers **49** are used, or if a retainer such as **51** is employed. The frictional action at the head is adequate to hold the keys, even if they are not positively held at the shank end. Preferably, however, the case should contain the number of keys for which it was designed. While the drawings illustrate a case for containing three keys, the case may be designed, using the described features, to hold various numbers of keys.

I have described my invention in detail so that those skilled in the art will understand the manner of practicing the same, but the scope of the invention is defined by the claims.

I claim:

1. A key case comprising a case body with front and rear plates joined together at their tops with two spaced narrow webs, said plates having spaced bead portions between the webs, each such plate comprising a generally rectangular key shank-retaining portion and a rounded offset for receiving the key heads, said offset portions having holes, a key retainer extending through said holes for engagement through the usual holes in the key heads, said plates normally converging away from said webs, a pair of parallel kerfs being provided at the top of the rear plate immediately adjacent said webs to thereby form a separate tab, and a fulcrum secured to the front plate with its apex engaging said tab portion below the top thereof, whereby when tops of the plates at said tab portion are squeezed between the thumb and fingers said plates are caused to diverge because of the rear plate rocking around the said fulcrum, whereby keys functionally held between the plates may be permitted to drop from between them by the biasing action of gravity.

2. A key case as defined in claim 1 wherein said case body is formed of plastic, the front plate being of substantially uniform thickness and the rear plate being thickened at said tab with a thickened portion extending therefrom toward said rounded offset portion, whereby to cause the

key-retaining portion of said rear plate to move as a unit around the said fulcrum.

3. A key case as defined in claim 1 wherein said retainer comprises a horse-shoe shaped member and said plates have straight recesses near one web portion facing toward the center of the holes through which the retainer passes, whereby to receive and retain ends of the retainer, and wherein similarly facing offsets are provided adjacent the holes to permit free relative movement of the plates without binding from the rounded portion of the retainer at its bight.

4. A key case comprising an integral plastic body with front and rear plates of identical outline joined together at their tops by two spaced thickened webs, each plate having a generally rectangular portion for receiving key shanks and a rounded perforated offset portion for receiving key heads, the said front plate being of substantially uniform thickness, the rear plate having a thickened portion running from its top downwardly with a thickened extension running partly into its rounded offset portion, a pair of parallel kerfs forming a tab being provided in the rear plate between said thickened portion and said webs, a thickened portion also being provided at the top and below the web furthest removed from the offset portion, a plastic wedge-shaped fulcrum secured to the front plate and having its apex in engagement with the tab forming a part of the rear plate below the top thereof and

between said kerfs, said plates being sharply convergi from top to bottom, each plate having a thickened be near its top and said beads being separated by an op space, and a horse-shoe shaped key retainer with its bi extending through the said perforations in the round offset portions of the plates, recesses facing said perfor tions being provided in the plates near one of said we to receive ends of the horse-shoe shaped retainer an anchor the same, the said retainer being sufficientl spaced from the plates as not to interfere with their rel tive movement, pressing together of said plates at the tops between said kerfs and above the fulcrum causin said rear plate to move about its fulcrum, with som warping of such plate near said web portions, to caus the entire key-holding portions of said plates to diverg and release keys by gravity, bottom edges of said plate being sufficiently thin to permit forcing keys back betwee them without the described pressing action.

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