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2,855,810

KEY BLANKS AND METHOD OF MAKING SAME

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Fig. 3

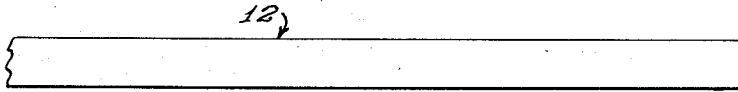


Fig. 4

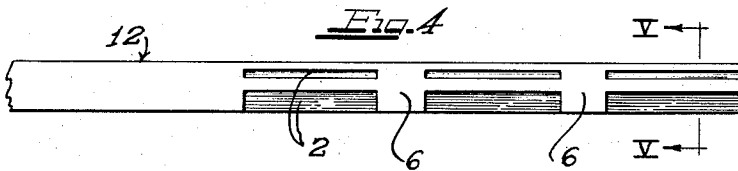


Fig. 6

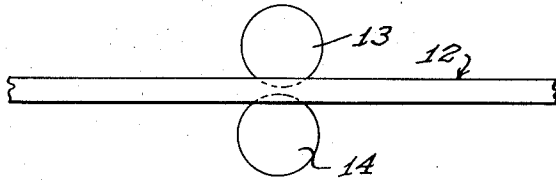


Fig. 5

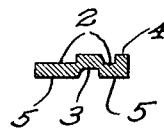


Fig. 7

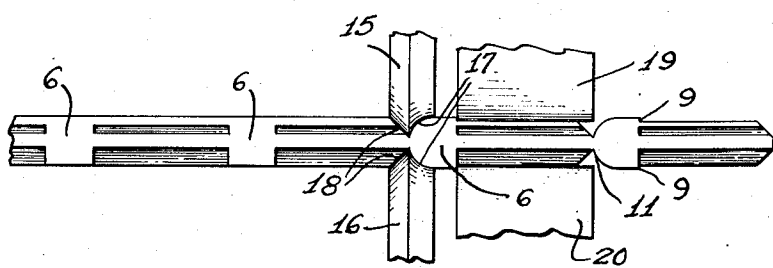


Fig. 8

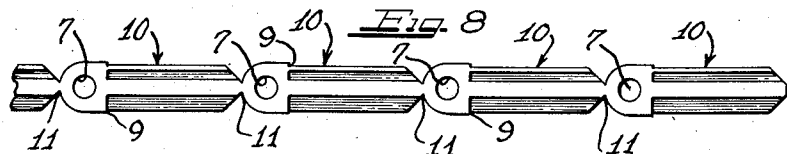


Fig. 2

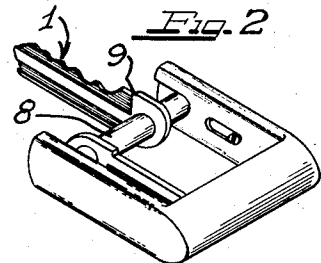
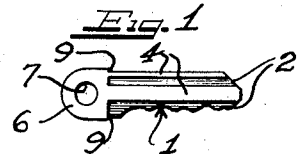


Fig. 1



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**KEY BLANKS AND METHOD OF MAKING SAME**

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6 Claims. (Cl. 76-110)

The present invention relates to the construction of a novel key strip from which individual keys may be taken for finish profile cutting. The invention also contemplates provision of a novel method of manufacturing such key strips.

More particularly, this invention relates to the provision of a novel key strip which may be utilized to provide a plurality of individual key blanks of the type adapted for use with the key and key case combination more fully disclosed and described in my copending application, Serial No. 352,752, filed on May 4, 1953. In the above mentioned copending application, I have shown and described a novel key and key case combination which utilizes substantially headless keys. Since no head is provided on these keys, processes for manufacturing the keys may be improved over those processes of the prior art which require that the keys be individually machined from individually manufactured key blanks.

It is an object of the present invention to provide a method for manufacturing a key strip formed of a plurality of key blanks frangibly secured end to end.

Another object of the present invention is to provide a key strip which will permit the storage of a great number of key blanks in a minimum amount of space.

A further object of the present invention is to provide a key strip which may be economically manufactured by modern high speed production equipment.

Another feature of this invention is to minimize the number of operations involved in making keys by performing like operations simultaneously on large numbers of key blanks in strip form.

A still further feature of the present invention is a key strip containing a plurality of key blanks frangibly secured end to end for storage and from which individual key blanks may be broken off for use as needed.

Yet a further object of the present invention is to provide a novel method of manufacturing a key strip containing a plurality of individual key blanks.

Still another object of the present invention is to provide a novel method of preparing key blanks for use by retail lock smiths and others needing a supply of key blanks in a readily usable and easily storable form.

Still other objects and features of the present invention will become apparent to those skilled in the art from a consideration of the following specification and attached drawings wherein a preferred embodiment of the invention is shown.

On the drawings:

Figure 1 is a plan view of a finished key produced from the key strip of the present invention;

Figure 2 is an isometric view of a plurality of keys constructed according to the teachings of the present invention, in position on a key case of the type disclosed in my above mentioned copending application;

Figure 3 is a plan view of a continuous strip of key material prior to processing according to my invention;

Figure 4 is a plan view of the key strip shown in Fig-

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ure 3 subsequent to the machining of lands and grooves therein;

Figure 5 is a cross sectional view taken along the line V—V of Figure 4;

Figure 6 is an enlarged side elevation view of the key strip showing the method of machining the lands and grooves shown in Figure 4 and 5;

Figure 7 is a plan view of the key strip shown in Figure 4 in process of semi-parting and edge grinding; and Figure 8 is a plan view of the finished key strip of my invention.

As shown on the drawings:

As was discussed above, keys constructed according to the techniques disclosed in my copending application, require no head or finger grasping portion. Such a key is shown in Figure 1 of the attached drawings, and as may be therein seen, it comprises a lock actuating portion 1 provided with grooves 2 and 3 and lands 4 and 5. At the left hand end of the key a small supporting portion 6 is provided for positioning the key in a key case such as that disclosed in my above mentioned copending application, and as herein shown in Figure 2. The key is provided with an aperture 7 for cooperation with a support spindle 8 of the key case, and is further provided with stop abutments 9 which prevent the over insertion of the key into the lock which is to be operated.

As those who have purchased individual keys from a lock smith will recall, the usual manner of storing the necessary individual key blanks utilized with the present day locks, is to maintain a plurality of hooks with a number of individual key blanks mounted thereon. This arrangement of course requires a rather large amount of space and is partially necessitated by the fact that prior art keys have been manufactured in an individual manner. In order to eliminate the need for this individual treatment and the excessive space required thereby, I have provided a novel key blank which may be stored in long lengths. Since only relatively few numbers of land and groove combinations are utilized in locks, the locksmith is required, when utilizing my invention, to maintain in stock only a small number of long strips, herein called key-strips, of key blanks.

These key strips comprise a series of key blanks frangibly connected as at 11. The individual keys indicated generally at 10 are provided with insertion stops 9, lock operating grooves and lands, and support apertures 7. When it is desired that a key be made having a groove and land configuration of a particular key strip, one of the keys for example, the extreme right hand key, as viewed in Figure 8, is broken away from the remaining keys by bending the key strip at the necked down portion 11 between the end key and the key blank adjacent thereto. This provides a key blank which may be machined in the usual profiling machine to provide a key such as that shown in Figure 1.

In manufacturing the above mentioned key strip, a long strip of key material such as for example, brass or aluminum is utilized. This strip indicated generally at 12 in Figure 1 is then machined as shown in Figure 6. In that figure, in which the elements are shown in enlarged form, the strip 12 is passed between milling cutters or grinders 13 and 14. In this processing step the key strip 12 is passed between the cutters 13 and 14 for a distance sufficient to cut grooves 2 and 3 of a length sufficient to provide a lock operating surface of the necessary length. This usually runs about  $1\frac{1}{16}$  inches in connection with locks in general use today.

As the strip 12 continues to pass under the cutters 13 and 14, the latter are moved away from the strip 12 temporarily as a small portion, approximately  $\frac{3}{8}$  of an inch, is permitted to pass through the cutters without

being machined. This unmachined portion which is indicated at 6 in Figures 4 and 7 becomes the supporting portion for the key in its finished condition.

After the milling step shown in Figure 6, the key strip emerges in the form shown in Figures 4 and 5.

It is then machined as shown in Figure 7 wherein parting grinders 15 and 16 are utilized to notch the strip to thereby provide necked down frangible connecting portions between the individual key blanks. As may be clearly seen from Figure 7, the parting grinding wheels 15 and 16 have contoured peripheries having a radius curve 17 on one side and an angular contour 18 on the other side. This conformation of the grinding wheels provides a rounded edge on the left hand end of the individual key blank and provides a pointed end on the right hand end of the individual key blank as shown in Figures 7 and 8.

At the same time that the parting grinders 15 and 16 are machining the end portions of the individual key blanks, the grinders 19 and 20 are utilized to remove the material at the edges of the key strip. Removal of this material provides the abutment insertion stops 9 desirable in the final product to prevent over insertion of the key into the lock.

Upon completion of the above mentioned step the final step of piercing the support apertures 7 is performed. The apertures 7 may be pierced by means of a punch or may be drilled if desired. In view of the fact that the key strip must remain stationary during the parting and abutment providing steps mentioned above, it is contemplated that the piercing of the aperture 7 may take place at the same time that the parting operation is performed if desired. It may however of course be performed subsequent to the parting operation where automatic tools of the type which would permit such multiplicity of operations are unavailable.

With the finished key strip in the form shown in Figure 8, in stock, the locksmith need only break off a key blank as he needs at any particular time. In this manner it is possible for him to keep in supply a few long strips of a length which is limited only by his space limitations, for the various types of key configurations. Due to the fact that keys are generally made of a relatively soft material in order to prevent damage to the lock parts, there is no difficulty in breaking off the necked down portion between key blanks. It is of course realized that if the keys are to be manufactured from a relatively hard key material, it may be necessary to remove more material from the necked down portion 11 than is shown in the figures of the drawings. This amount of removal, depends of course, solely upon the breaking characteristics of the key metal used and may be varied within reasonable limits without departing from the spirit or concepts of my invention.

While I have shown a method of manufacturing the key strip of the present invention by means of grinding apparatus such as that shown in Figure 7, it is also contemplated that alternative methods may be utilized which eliminate heretofore used multiple handling of individual blanks. For example, it is within the purview of my invention to stamp the necked down portions 11 as well as the abutment stops 9 by means of an ordinary piercing operation. Under such circumstances it would of course be desired that the apertures 7 be pierced simultaneously with the removal of the remainder of the metal. In such an operation the key strip would be manufactured by initially milling the grooves and lands to provide the key strip such as shown in Figure 4 and subsequently piercing the strip to provide in a single operation the key strip shown in Figure 8.

If desired, only one stop 9 can be provided by eliminating the grinding or piercing operation to produce the other stop. Alternatively, the key blank strip can be formed without any stops 9 and the desired stop can

be placed on the separated blank piece when the lock actuating portion is formed.

It will thus be observed from a consideration of the above specification and drawings that I have provided a novel key strip and method of making the same which will eliminate to a great extent the need for carrying a large number of miscellaneous individual key blanks in stock while at the same time providing an extremely simplified key blank utilizing an absolute minimum of material.

While a single embodiment of my invention has been shown it is of course realized that modifications and variations may be made without departing from the scope of the novel concepts of my invention.

I claim as my invention:

1. A key strip comprising a plurality of substantially headless key blanks integrally secured together in end to end relation, each of said key blanks being secured to its neighbor by a reduced frangible section extending between a pair of notches in the sides of said strip, said notches having one angular wall forming the lock operating end of the individual key blank and one curved wall forming the outer key supporting end of each individual key blank.

2. A key strip comprising a plurality of individual key blanks integrally secured in end to end relation, each of said individual key blanks having a key supporting portion with an aperture therein and a lock actuating portion having lands and grooves extending longitudinally therealong, said actuating portion having a lateral width slightly smaller than that of said supporting portion.

3. A key strip comprising a plurality of key blanks integrally secured end to end, each of said blanks having a grooved portion and ungrooved portion, said integral connections between said blanks comprising notched portions providing a frangible connecting strip which connects adjacent ungrooved portions to adjacent grooved portions whereby individual key blanks may be removed from said key strip by breaking the frangible connecting strip between the individual key blanks.

4. The method of manufacturing a key strip which comprises preparing a continuous strip of key material having a uniform cross section substantially equal to the maximum outer lateral dimensions of a key, machining longitudinal grooves intermittently along said strip, notching the strip at one end of each grooved section with a notch having one wall of a configuration of a key head periphery and the other wall of a configuration of a key blade end, and piercing an aperture through each ungrooved section of said strip.

5. The method of manufacturing a key strip having a plurality of key blanks integrally secured together in a frangible manner which comprises providing a substantially smooth continuous strip of key material having a cross section substantially equal to the outer dimensions of a lock operating portion of a key, removing material along the longitudinal axis of said strip in an intermittent manner to provide a strip having longitudinally extending grooved portions with ungrooved portions therebetween, notching the edges of said strip at points immediately adjacent one end of each grooved portion with a notch having one edge forming the end of the grooved portion and the other edge forming the end of the next adjacent ungrooved portion, and piercing an aperture through each ungrooved portion.

6. The method of manufacturing a key strip which comprises providing a longitudinally extending continuous strip of key material, grooving said material longitudinally on its flat dimension in an intermittent manner to provide alternating grooved and ungrooved sections, notching the side edges of said strips at points adjacent each successive grooved section, removing a small amount of material from the side edges for the full thickness of the material along the longitudinal length of each grooved section, and piercing an aperture through each of the

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ungrooved sections remaining between successive grooved sections.

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