United States Patent [19]

Hare

[11] **3,730,322**

[45] **May 1, 1973**

[54] **CHANGEABLE TYPE HEADS AND CHANGEABLE KEY CAPS**

[75] Inventor: **Lloyd E. Hare,** West Hartford, Conn.

[73] Assignee: **Litton Business Systems, Inc.,** New York, N.Y.

[22] Filed: **Mar. 24, 1970**

[21] Appl. No.: **22,177**

[52] **U.S. Cl.** **197/36,** 197/102

[51] **Int. Cl.** **B41j 1/04**

[58] **Field of Search** 197/4, 36, 37, 98, 197/102, 103, 104

[56] **References Cited**

UNITED STATES PATENTS

1,823,130	9/1931	Smith	197/98
2,975,881	3/1961	Delponte et al.	197/36
569,196	10/1896	Graham et al.	197/103
385,565	7/1888	McLaughlin	197/36 X
895,652	8/1908	Macis	197/36
3,101,141	8/1963	Canny	197/36
3,308,916	3/1967	Canny et al.	197/36
3,432,018	3/1969	Watanabe et al.	197/36

Primary Examiner—Ernest T. Wright, Jr.
Attorney—Joseph R. Spalla

[57] **ABSTRACT**

Type elements bearing special types thereon are constructed for snap-on application onto a type lever in a manner so that any such type head, when applied, becomes solidly secure on the type lever, except in a direction counter to that in which centrifugal force tends to have a throw-off effect thereon. Flexibly displaceable means allow the type heads to be readily moved into and out of applied position. In conformance with the applicable type heads, there are character bearing caps adapted to be snapped onto and off type keys.

1 Claim, 7 Drawing Figures

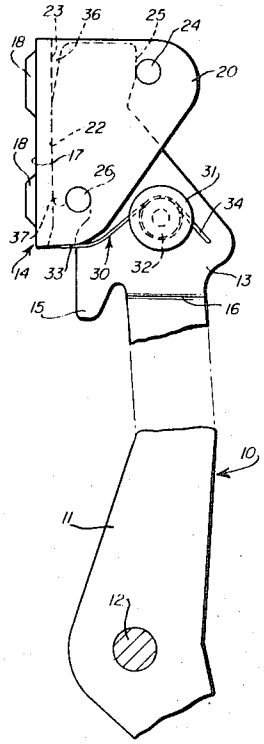


Fig_1

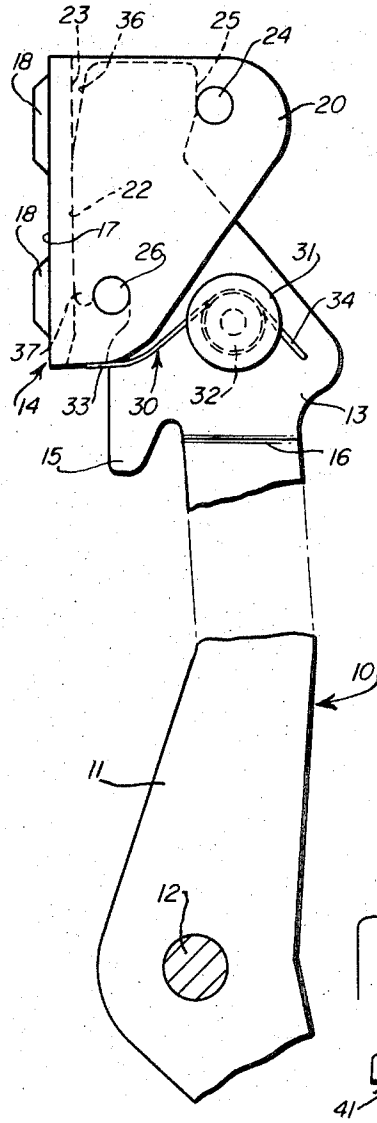


Fig_2

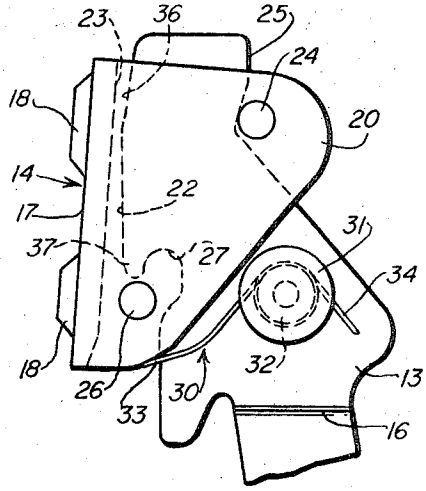


Fig_3

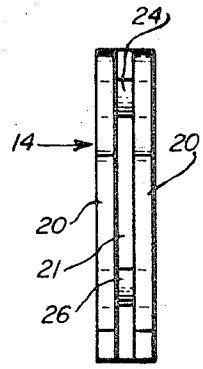


Fig_4

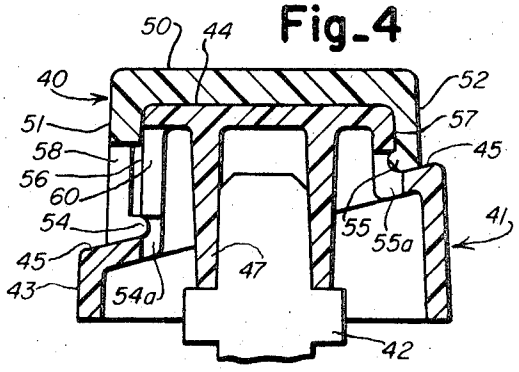


Fig_7

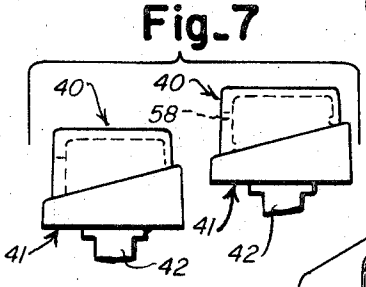


Fig_5

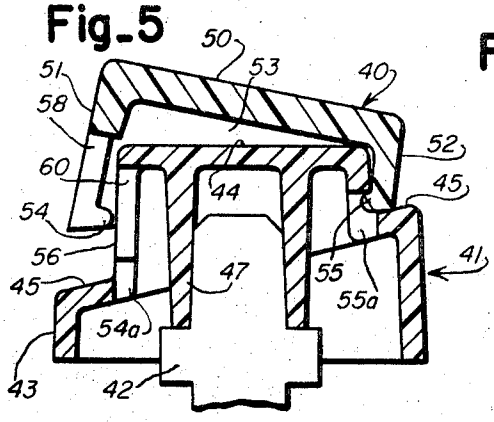
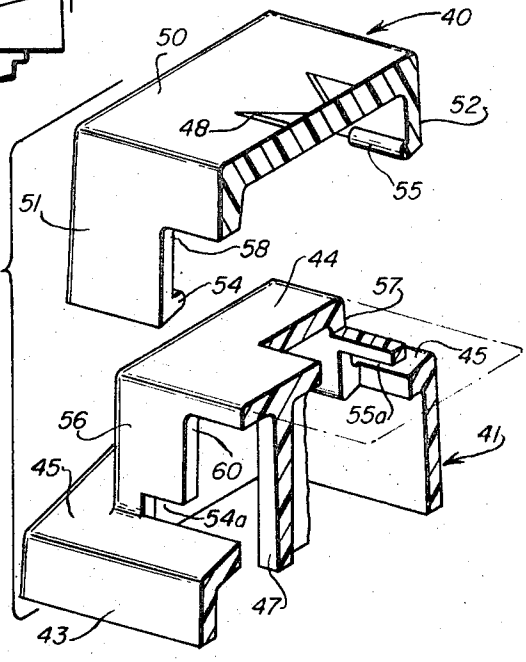


Fig_6



CHANGEABLE TYPE HEADS AND CHANGEABLE KEY CAPS

BACKGROUND OF THE INVENTION

It is well known to apply type elements in a removable manner to type levers of typewriters, as for example, in a U.S. Pat. to Canny No. 3,101,141, dated Aug. 20, 1963. In a U.S. Pat. to McLaughlin No. 385,565 dated July 3, 1888, a type element is removably securable to a type lever and a type key has a character identifying insert which is slidably applicable thereto.

SUMMARY OF THE INVENTION

It is conceived to provide a type element for association onto a type lever in a readily and easily applicable and removable manner, and so that when the type element is in an applied position, it is not liable to be thrown off during type lever operation. The type element, when in position on the type lever, is solidly retained in all directions except counter to the direction in which during type lever operation the type head tends to be thrown off by centrifugal action. The type element, when in position on the type lever is particularly also solidly located thereon in the movement directions to and from typing position. In the direction counter to the centrifugal effect, a light spring is sufficient to hold the type element in place for functional use, and allows it to be forced easily into and out of applied position. This spring, although of light force, is adequate since during operations and restorations of the type lever there are no forces generated which tend to move the type element toward the type lever pivot.

Other objects and advantages will become evident later from the detailed description of the invention which follows.

DESCRIPTION OF THE DRAWING

FIG. 1 is a left hand side elevation of an end portion of a type lever with a detachable type element thereon;

FIG. 2 is a side elevation similar to FIG. 1, but the type element is in the process of being applied or removed from the type lever;

FIG. 3 shows the type element in elevation as viewed in the direction in which the types on the type element face;

FIG. 4 shows in side elevation a permanent type key button along with a type identifying cap removably carried thereon;

FIG. 5 is similar to FIG. 4 but the cap is in the process of being installed or removed;

FIG. 6 is a front perspective view showing the type key button and the type identifying cap seen in FIG. 4, the cap being posed above the key for application thereto; and

FIG. 7 shows two type key buttons with removably applicable type identifying caps thereon, in side elevation.

Referring now to FIG. 1, a type lever 10 has a main portion 11 whereby it is pivotally carried on a usual pivot rod 12 provided in a usual type lever segment, not shown. Beyond said main portion 11, the type lever 10 includes an extending portion 13 for carrying a type element 14 removably thereon. Such extending portion 13 includes a usual nose 15 for entering a usual type guide, not shown, to accurately control the final movement of the type lever 10. The shown type lever 10 is one of a system of type levers of which any one or more may be constructed to receive removably a type element 14 with different or special types 18 thereon. The type lever 10 embodies a conventional bend as at 16, providing that the type element 14 during type lever operation will approach its printing position in proper posture.

The type element 14 has a face portion 17 whereon there is carried at least one type 18, two being shown, of which one is a lower case and the other an upper case type. From the face portion 17, there extend, in oppositely flanking relation to the type lever portion 13 two side walls 20, which form there between a slot 21 wherein the type lever portion 13 is closely fitting. An edge 22 on the type lever portion 13 is for some distance in solid contact with a base 23 of the slot 21 near the face portion 17 of the type element 14.

The type element 14 embodies near its extending end a locating means in the form of a pin 24 which extends through the walls 20 of the type element 14, solidly carried thereon, and is in contact with an edge 25 on the extending end portion 13 of the type lever 10. Near the other end, the type element 14 has solid therein another locating means in the form of a pin 26 extending through its walls 20. Such pin 26 is seated in a notch 27, of the type lever portion 13 which faces open side toward the type lever pivot 12. Therefor, this second locating means or pin 26 has seating accommodation in the notch 27 in a direction away from the lever pivot 12, which is the direction in which the type element 14 tends to be thrown off by centrifugal force when the type lever 10 is being operated. It will be observed that in the installed state of the type element 14, the edge 22 of the portion 13 of the type lever 10 is in contact with the base 23 of the type element slot 21 whereas at the extending end of the type lever portion 13 the pin 24 acts confiningly thereon in cooperation with the base 23 of the slot 21.

In order to hold the type element 14 normally seated by its pin 26 in the notch 27 in operative position as shown in FIG. 1, a torsion spring 30 is carried on a short, headed stud 31 which has support on the extending type lever portion 13. Said spring 30 has one or two turns wrapped around the stem 32 of the stud 31 and one spring end 33 has a transversely bent terminal portion which bears resiliently directionally away from the type lever pivot 12, against the type element 14. Another spring end 34 has anchorage in a hole of the lever portion 13.

It will be evident from FIG. 1, that the type element 14 is carried on the type lever portion 13 without being capable of movement directionally away from the type lever pivot 12, as by centrifugal force generated during type lever operation. Also in the direction in which the type lever 10 swings, the type element 14 is firmly secure. Only in the direction counter to the direction in which the centrifugal force acts is the type element 14 movable on the type lever 10 and in such direction movement is resisted by the pressure of the spring end 33.

It is evident that during operation of the type lever 10 there is no force encountered or developed which tends to cast off the type element 14. If neighboring type ele-

ments 14 clash during operations the clashing action takes place circularly about the pivot 12 so that the type elements 14 remain firmly secure even though only the spring 30 resists its movement toward the type lever pivot 12.

The type element 14 is placed onto the type lever 10 by introduction of its slot portion 21 intermediate the pins 24 and 26 to the end of the extending lever portion 13. In so doing the base 23 of the slot 21 of the type element 14 is first leaning away from the edge 22 of the lever portion 13 so that the pin 26 is in front of said edge 22. The edge 22 on the type lever end portion 13 has a receding extension at 36 to allow such introduction. With the pin 26 then brought into engagement with the edge 22, the type element is then moved directionally toward the type lever pivot 12, and then as shown in FIG. 2 the type element 14 is pressed so that its pin 26 will come into a position opposite the notch 27, so as to allow it to enter into such notch 27 under the tension of the spring 30. While the type element 14 is handled to place its pin 26 opposite the notch 27, the end thereof which carries the pin 26 becomes engaged with the spring 30, as shown in FIG. 2. However, despite the spring 30 the type element 14 is very easily moved into position and in fact after the pin 26 is opposite the notch 27 the spring 30 tends to exert its power to cause the seating of the pin 26 into the notch 27. It is evident from FIGS. 1 and 2 that the notch 27 in conjunction with the edge 22 forms a nose 37 past which the pin 26 is moved into seated position.

The removal of the type element 14 is easily effectable by a reverse procedure, the first step being to move the type element 14 for the pin 26 to move out of the notch 27 and past the nose 37, and the second step being to draw the type element 14 off the end of the extending lever end 13.

Due to the fact that spring 30 can be of minimal strength and that the type element 14 is the only loose part to be handled, the application and removal of the type element 14 is very easily and efficiently effectable.

The invention, related to the facility for placing desired type elements 14 on the type levers 10, provides also for application of type identifying caps 40, see FIGS. 4 to 7, to key buttons 41 which have permanent support on type selecting key steps 42. Such permanent key buttons 41 are molded of plastic material. They have a square bottom portion 43 and a square top portion 44 of lesser size rising from the square bottom portion 43. A shelf 45 surrounds the square top portion 44 and preferably is slanting upwardly and rearwardly in agreement with the general slant of the keyboard, see FIG. 7. The button 41 preferably is hollow except for an internal boss 47 by which it is carried on a key stem 42.

The stated caps 40 bear type identifying indicia 48, see FIG. 6, and preferably are also molded of plastic material. Each cap 40 has a square top panel 50 from which there depends a skirt consisting of a front wall 51, a rear wall 52 and two opposite side walls 53. The front wall 51 has two laterally spaced internal protuberances 54, only one of which is shown in the drawing, and the rear wall 52 has an internal single central protuberance 55. These protuberances 54, 55 are at the bottom limits of their respective walls 51, 52. The square top portion 44 of the permanent key button 41 has on its front wall 56 and the rear wall 57, close to the bottom limits thereof, respectively material reliefs or cut-outs 54*a* and 55*a*, such reliefs 54*a*, 55*a* being adapted to receive the aforestated protuberances 54, 55 on the skirt walls 51 and 52. Said protuberances 54, 55 on the skirt walls 51, 52 of the cap 40 are correlated so that if the protuberance 55 on the rear wall 52 is first presented to the material relief 55*a* in the rear wall 57 of the key button 41, and then the cap 40 is swung down at the front, the front wall 51 of the cap 40 will swing with a minimal front and aft displacement into applied position over the top portion 44 of the key button 41. In such downward movement the protuberances 54 within the front wall 51 of the cap 40 will first contact against the front wall 56 of the top portion 44 of the key button 41, just above the reliefs 54*a*, and upon continued and forced movement there occurs a temporary flexure of the cap 40 until the protuberances 54 become seated in the reliefs 54*a* on the key button 41. It will be noted that the shelf 45 at the rear of the square top portion 44 affords a rest whereby the protuberance 55 can be appropriately presented to the relief 55*a* in the permanent key button 41.

In order to render the cap 40 easily removable, a cut-out 58 is provided in the lower portion of its front wall 51 to afford a finger hold for prying it off. Preferably also, the front wall 56 of the upper portion of the permanent key button 41 has a cut-out 60. This cut-out 60, see FIGS. 4 and 6, reaches to a higher level than the cut-out 58 in the front wall 51 of the cap 40. The tip of an operator's finger is thus insertable into the void provided by the cut-outs 58, 60, and when upward pressure is applied, the front protuberances 54 will move out of the reliefs 54*a*. Such out-movement takes place before the operator's finger comes into firm contact with the upper extremity of the cut-out 60 in the key button 41. The removal of the cap 40 is then completed by grasping it bodily. Another cap 40 having other indicia 48 thereon may then be substituted. From an inspection of FIG. 7, it can be seen that in view of the stepped arrangement of the keyboard there is just enough room to afford finger holds in the cut-outs 58 for effecting cap removals.

I claim:

1. A type bar assembly for removably securing a type element onto a type bar, the combination comprising:

a type element having a type bearing face formed thereon,

a type bar for carrying said type element on an end portion thereof and being supported for pivotable movement about a pivot,

said end portion of said type bar terminating in the direction centrifugal force acts during a pivotable movement of said type bar and having a forward edge facing in the direction of a printing movement and a rearward edge facing in the direction of a return movement,

said type element having wall means defining a slot with a base portion adjacent the type bearing face for receiving the end portion of said type bar,

a first locating means formed on said type element for engaging and guiding the end portion of said type bar into the slot of said type element,

a second locating means formed on said type element for engaging and guiding the end portion of said type bar into the slot of said type element,

said end portion of said type bar being received into the slot of said type element between said first and second locating means with the rearward edge engaging said first locating means and the forward edge engaging said second locating means,

a resilient biasing means for urging said type element toward the end of said type bar and being engaged by said type element upon receipt of the end portion of said type bar between said first and second locating means,

said forward edge of said type bar having a notch formed therein and opening away from the end of said type bar and generally toward the pivotal support of said type bar,

said second locating means being spaced from the base portion of said type element and being received in the notch under the urging of said resilient biasing means to prevent movement of said type element toward the end of said type bar,

said base portion of said slot formed in said type element engaging said forward edge of said end portion upon receipt of said second locating means in said notch, and

said first locating means engaging said rearward edge of said end portion upon receipt of said second locating means into said notch.

* * * * *