Dec. 5, 1939. J. P. WARD, JR 2,181,955

FINGER KEY FOR TYPEWRITING AND OTHER MACHINES

Filed March 7, 1938

Fig. 1.

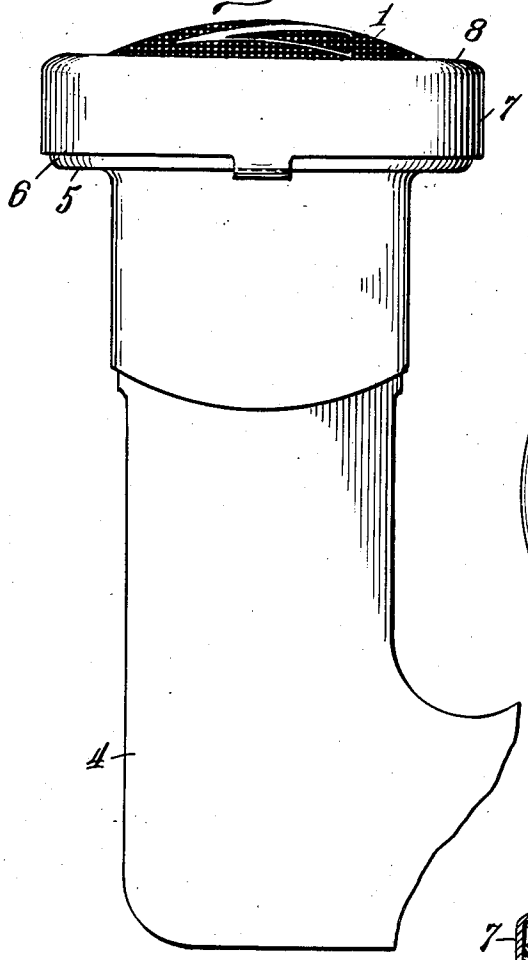


Fig. 2

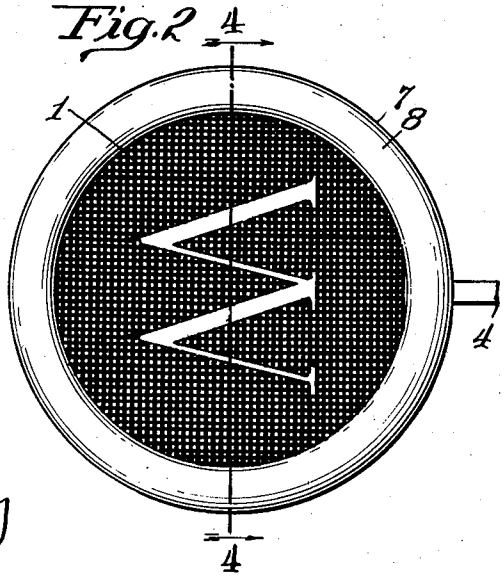
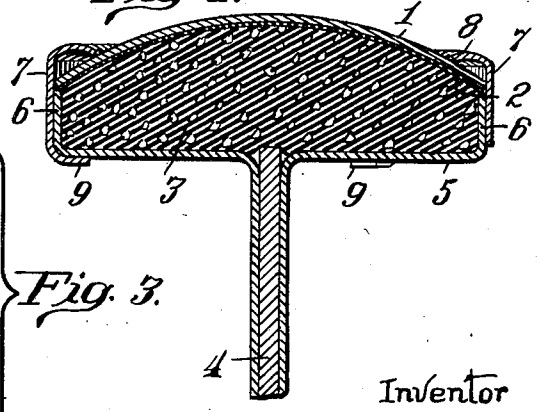


Fig. 4.



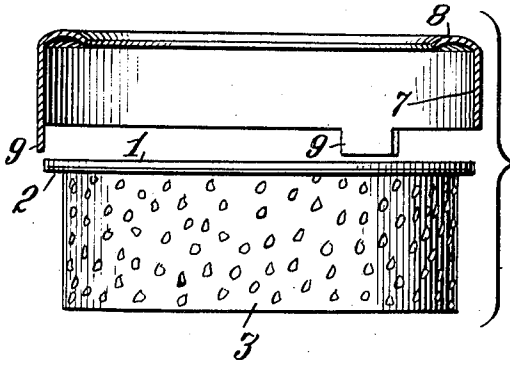


Fig. 3.

Inventor

James P. Ward Jr.

By Rudolph W. Lotz

Attorney

Patented Dec. 5, 1939 2,181,955

UNITED STATES PATENT OFFICE

2,181,955

FINGER KEY FOR TYPEWRITING AND OTHER MACHINES

James P. Ward, Jr., Chicago, Ill., assignor to James P. Ward, Chicago, Ill.

Application March 7, 1938, Serial No. 194,321

6 Claims. (Cl. 197—103)

The main object of the present invention is to provide a finger key for typewriting and other machines which affords a plurality of advantages over the devices of this type now commonly used and such as have not been proposed heretofore so far as I am informed.

In the operation of typewriting machines equipped with character bearing keys of the types incorporated into machines, the hardness of the surfaces struck by the finger tips is extremely objectionable because it causes injury to finger nails and also causes the finger tip areas contacting with the hard surfaces to become more or less callous. A further objection lies in the fact that the character bearing portions of the keys are bordered by upwardly projecting flanges in many instances, said flanges being very narrow and thus presenting edges that are sufficiently sharp to indent the edges of finger nails coming in contact therewith.

As the majority of the finger-tip operated machines are operated by young women who maintain their finger nails relatively in harmony with present day custom and style, manufacturers of machines of this type have, in the main, substituted what are known as "molded" character-bearing keys for the old and well-known metal-flange bordered glass or celluloid disks, the molded keys being devoid of metal rims which would catch and often break the finger nails of the operators. The molded keys are relatively brittle and the replacement thereof is relatively expensive.

A cushioned key is most desirable and it has become common practice to dispose inverted cup keys of soft rubber over the keys incorporated by the manufacturers into their machines. Some of these rubber devices are equipped also with relatively light springs to increase their resiliency. Keys of the last-named type must be purchased separately and are also quite expensive and are open to numerous objections, among which is the fact that they are too easily removed and are, therefore, frequently lost or stolen. It is also true that they become displaced so that the characters thereon become disposed angularly and reversely to their normal positions.

The primary and main object of the present invention is to provide a typewriter key which is amply cushioned, is cheap and is easily substituted for the most commonly used structure, such as the cardboard backed disks disposed within the cups and ferrules of the key levers and which, while confined by the circumferential flanges of the ferrule, present high crowned sphero-convex outer faces which obviate all possibility of such contact of finger nails with said flanges as may injure them.

A feature and object of my invention lies also in utilizing the resiliency of the character bearing disk of my invention as a cushioning element per se and vice versa, utilizing the main cushion of the structure as a means for maintaining the character bearing disk normally in the said high-crowned sphero-convex shape.

Another feature and object of the invention resides in making the resilient cushion of smaller cross sectional area and plan than the opposed surface of the character-bearing disk and spacing it equi-distantly from the peripheral or circumferential edge of the disk so that when the cushion is confined and compressed, the body portion thereof will bulge laterally to fill the free space between it and the surrounding ferrule or wall of the cup of the key lever, as the case may be, but will also cause the greatest pressure of said cushion to be exerted against the middle portion of the character-bearing disk to bulge the same into said sphero-convex shape.

A suitable and exemplary embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a fragmentary side elevation of a key lever equipped with a conventional type of cup and a ferrule for confining the character-bearing disk and cushion of the present invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a view in side elevation showing the ferrule of a key lever and its character-bearing disk and cushion structure of the present invention, disposed immediately below said ferrule.

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 2.

Referring first to Fig. 3, it will be noted that the character-bearing disk 1, composed of sheet celluloid, or similar resilient material adapted for the purpose, is equipped on its lower face with a coating 2 of a suitable material which constitutes a background for the character usually printed upon the lower face of the disk 1.

In the instance illustrated, as shown in Fig. 2, the character is white and is displayed upon a dark background.

Secured to the lower face of disk 1, which usually is circular and is so shown in the drawing, is a cylindrical cushion 3 composed preferably of sponge rubber or a similar and highly resilient material such, for example, as the type of rubber used in the manufacture of elastic bands, and the like. The said cushion 3 is of appreciably

smaller diameter than the disk 1 and is disposed concentric with the latter; said cushion is suitably secured to the disk 1 by means of a suitable cement or in any other manner suitable to the purpose.

The said cushion 3 is of an appreciably greater length than the depth of the space in which it is confined upon the key lever 4.

The character disk receiving elements of the key levers are of different types, as, for example, in some instances the same are cups 5, equipped with cylindrical walls 6, as shown in Fig. 4, while in other cases the equivalent of the bottom wall 5 of the cup of Fig. 4 is devoid of any edged flange or is slightly dished to provide a substantially sphero-convex top wall.

In all instances ferrules 7 substantially indentical with that shown in the drawing, as in Fig. 4, and which are equipped with rounded inwardly projecting annular flanges 8, are disposed to embrace the character disk supporting surface of the key lever. The flanges 8 of the ferrules bear upon the peripheral or circumferential edge portions of the character bearing disks which generally are equipped with cardboard backs of relatively great thickness which constitute fillers for the space between the character-bearing disk and the supporting surface for the said cardboard backing.

By again referring to Fig. 3, it will be noted that the diameter of the disk 1 is substantially identical with the inner diameter of the ferrule 7, although said diameter of said disk 1 may be silghtly less or greater than the inner diameter of said ferrule.

When the cushion and ferrule are disposed upon the support therefor and the ferrule is secured in place by bending the projections 9 of the latter to engage underneath the support for the cushion of the character-bearing disk, then cushion 3 will obviously be compressed to a very appreciable extent. This compression causes the circumferential portion of the wall of the cushion to bulge outwardly and thus fill the free space around it, as shown in Fig. 4; it being observed, however, that the greatest compression force is exerted upon the cushion by the flange 8 of the ferrule 7. This pressure is exerted inwardly of the circumferential surface of the cushion 3 and tends, under influence of the disk 1, to effect displacement of cushion material toward the axis of the cushion, the disk 1 being bulged to present the high crowned sphero-convex face hereinabove referred to, the crown of said disk being then disposed at very appreciably higher elevation than the upper point in the flange 8 of the ferrule.

Pressure exerted upon the disk 1 by the finger tips will cause the latter to yield to such pressure by its own resiliency to which the resistance of the cushion 3 is added, so that both the disk and the cushion yield to such pressure, the degree of said yield being dependent upon the degree to which the cushion 3 is maintained normally compressed.

Obviously, the degree of cushioning effect obtained may be easily varied by effecting variations in the depth of the cushion 3 and the thickness of the disk 1, so that if desired, the yield of the cushion may be most relied upon and, on the other hand, the resiliency of the disk 1 may be most relied upon, but by means of the combined use of the two resilient elements, any desired degree of cushioning effect may be obtained with great ease.

An advantage of the invention lies in the fact that the disk 1 with its cushioning element 3 secured thereto may be disposed on cards in the same manner as is now prevalent, with the cardboard-backed character bearing disks now commonly sold in complete sets, wherein the said character-bearing disks are projected into holes in the display card in which they are held by friction and from which they are removed by pressure of finger tips on either face of the disk structure.

The highly resilient crown of the disk possesses the advantage that it maintains the finger nails out of position of contact with flange 8 of the ferrule during operation of the machine and the yield of the disk and cushions to the touch of the operator constitutes a most advantageous factor in preventing slippage of the finger tips along the key surfaces.

I claim as my invention:

1. A finger key for typewriting and other machines comprising a normally flat flexible character bearing disk, a cushion of soft resilient material secured to the nether face of said disk, a receptacle for said cushion, and a ferrule equipped with an inturned flange at one end overlapping the peripheral edge portion of said disk and secured at its other end to said receptacle, said ferrule being of less length than the original depth of said cushion and co-operating with said disk and said receptacle to maintain said cushion compressed to exert lateral pressure against the peripheral wall of the receptacle and the bottom wall thereof and distort said disk to maintain the same normally convex on its outer face.

2. A finger key for typewriting and other machines comprising a receptacle open at the top and equipped along the open end of its peripheral wall with an inturned peripheral flange, a normally flat character bearing disk composed of resilient material and which is of approximately the same diameter as the inner diameter of the peripheral wall of said receptacle disposed within the latter with the peripheral edge portion of the outer face engaged with the said flange, and a cushion of resilient material initially of appreciably greater length than the space between said disk and the bottom wall of said receptacle confined within and substantially filling said receptacle, the said cushion exerting pressure on said disk and the several walls in contact therewith to render the exposed face portion of said disk convex with the top portion thereof disposed outwardly of the plane of the outer face of said flange.

3. A finger key for typewriting and other machines comprising a receptacle open at the top and equipped along the open end of its peripheral wall with an inturned flange, a normally flat resilient character-bearing disk which is approximately the same diameter as the inner diameter of the peripheral wall of said receptacle disposed within the latter with the peripheral edge portion of its outer face engaged with the said flange, and a cushion of resilient material normally of appreciably greater length than the space between said disk and the bottom wall of said receptacle and of substantially the same lateral dimensions as those of the receptacle confined within and filling said receptacle, the said cushion exerting pressure on said disk to bulge the middle portion thereof to impart to it a normally substantially convex outer surface.

4. A finger key for typewriting and other machines comprising a receptacle open at the top

and equipped along the open end of its peripheral wall with an inturned flange, a normally flat characted-bearing disk composed of resilient material and which is approximately the same diameter as the inner diameter of the peripheral wall of said receptacle disposed within the latter with the peripheral edge portion of its outer face engaged with the said flange, and a cushion of resilient material normally of appreciably greater length than the space between said disk and the bottom wall of said receptacle confined within and substantially filling said receptacle, the said cushion maintained compressed within and exerting pressure on said disk over the entire face thereof to impart to it a normally substantially convex outer surface having its crown spaced appreciably from said flange.

5. A finger key for typewriting and other machines comprising a receptacle open at the top and equipped along the open end of its peripheral wall with an inturned peripheral flange, a normally flat character-bearing disk composed of a flexible material and which is approximately the same diameter as the inner diameter of the peripheral wall of said receptacle disposed within the latter with the peripheral edge portion of its outer face engaged with the said flange, and a cushion of highly resilient material of appreciably greater length initially than the space between said disk and the bottom wall of said receptacle and of lateral dimensions substantially equal to the inner lateral dimensions of said receptacle confined within and filling said receptacle and compressed therein, the said cushion exerting yielding pressure on all inner walls of the receptacle and upon said disk to render the exposed face portion of the latter yieldingly convex with the highest crown portion thereof disposed outwardly of the plane of the outer face of said flange.

6. A key for typewriting and other machines comprising a substantially cylindrical receptacle open at the top and having its circumferential wall equipped with an inturned flange bordering the mouth thereof, a circular resilient character-bearing disk of larger diameter than the said mouth disposed in engagement with the said flange within said receptacle, a cushion of a soft, resilient material of smaller diameter than said disk and of appreciably greater depth than said receptacle secured to the said disk concentrically therewith and confined in compressed condition within said receptacle and completely filling the latter, the pressure of said cushion on said disk maintaining its outer face sphero-convex with its crown spaced appreciably from said flange and projecting outwardly from the plane of the outer face of said flange.

JAMES P. WARD, JR.