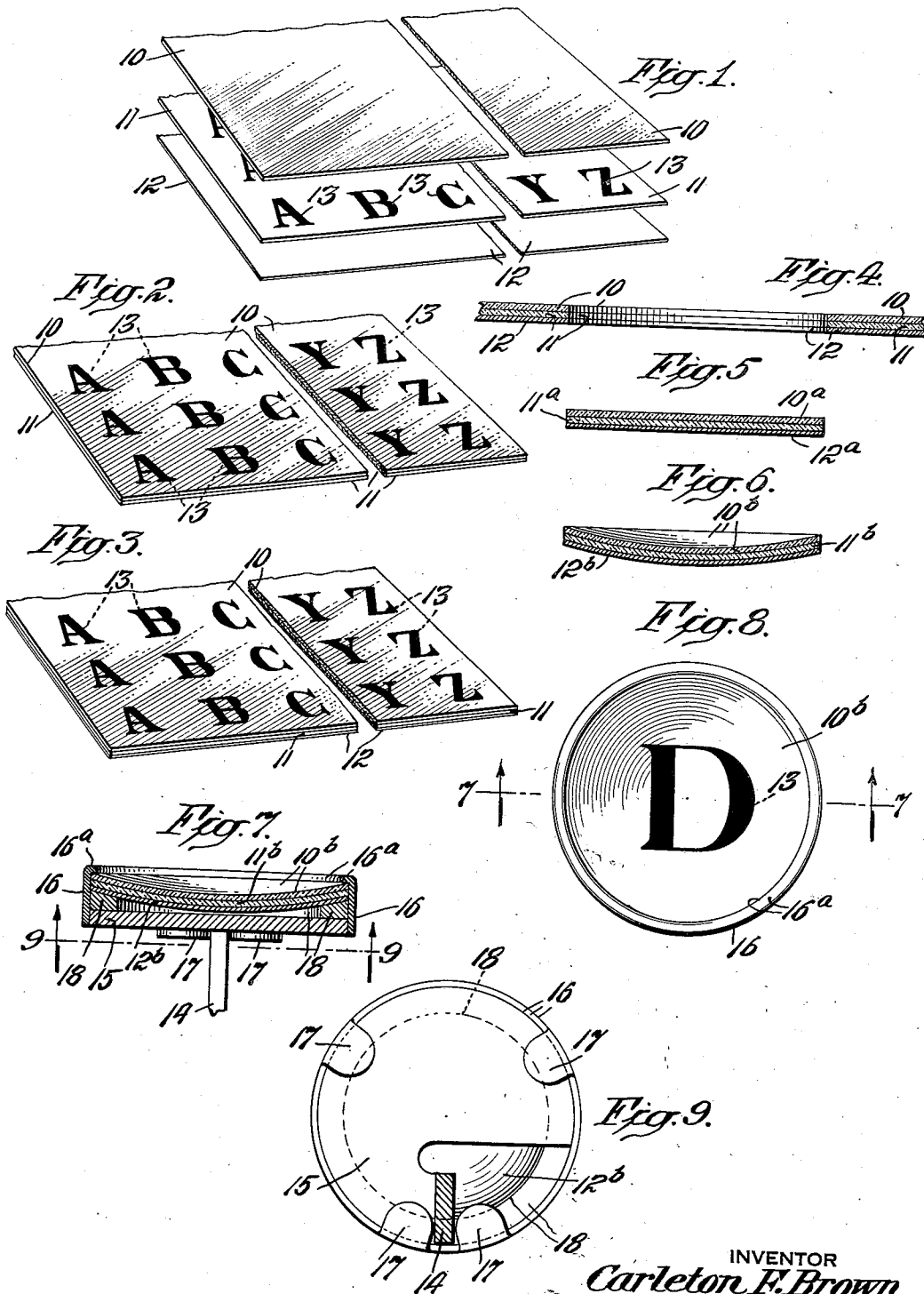


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TYPEWRITING MACHINE KEY

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TYPEWRITING MACHINE KEY

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This invention relates to typewriting machine keys. Such keys having concaved laminated character-bearing key-cards or disks formed of two plies of cellulosic material such as Celluloid and analogous material, adherently joined are known. In such a key the character disk is supported with its concave face uppermost, the upper ply of the disk being transparent and covering the printed or character-bearing face of the under ply of the two-ply disk, the latter ply being opaque.

In producing character-bearing key cards or disks of the kind above described it has been found that the concavity of such disks varies widely, and, since the concavity is given to the disks to provide an agreeable contact between the key and the finger of a typist, widely different degrees of concavity in different keys of the keyboard constitute a serious disadvantage defeating to a great extent the purpose for which the keys are provided with such cards or disks.

The present invention provides an improved concave and laminated character-bearing key-card or disk and an improved key including the same, whereby the difficulties above mentioned are avoided and such keys with disks of substantially uniform and constantly stable or fixed concavity may be readily produced commercially and economically.

Other features and advantages of the invention will appear from the following description of the preferred embodiment of the invention.

In the accompanying drawing:

Figs. 1, 2 and 3 are fragmentary perspective views showing different stages of formation of a three-ply laminated sheet from which a plurality of character-bearing disks are formed;

Figs. 4, 5 and 6 are detail vertical sectional views illustrating the formation of a concaved three-ply laminated character-bearing disk from the sheet shown in Fig. 3;

Fig. 7 is a sectional view on the line 7—7 of Fig. 8 showing an improved key including a character-bearing disk of the construction shown in Fig. 6;

Fig. 8 is a top plan view of the improved key shown in Fig. 7; and

Fig. 9 is a sectional view on the line 9—9 of Fig. 7 showing the improved key.

Referring to the invention by the drawing illustrating said invention as preferably exemplified and carried out, 10 is a transparent sheet of cellulosic material or composition such as transparent cellulose acetate, 11 is an opaque sheet of cellulosic material or composition such as

opaque cellulose nitrate, and 12 is a sheet of stiff but formable or bendable sheet metal such as sheet steel or sheet brass. Preferably, each of the sheets 10 and 11 is approximately .010 inch thick and the sheet 12 is preferably .0075 inch thick.

One face of sheet 11 is printed to provide thereon a plurality or series of type characters or key indicia 13 for different ones of a plurality or series of individual character-bearing disks, the characters being printed preferably in rows as shown. The three sheets thus far described are shown in Fig. 1.

From these three unconnected sheets a three-ply laminated sheet is formed, this laminated sheet being shown in Fig. 3. In said laminated sheet the three plies or laminae 10, 11 and 12 are adherently united or cemented together, a suitable binding agent or cement being used to effect adherence of sheet 12 to the unprinted face of sheet 11 and a suitable transparent binding agent or cement being used to effect adherence of sheet 10 to the printed face of sheet 11, heat and pressure being applied (as by means of a heated press) to effect the joining of the sheets by the interposed binding agents. Preferably, sheets 10 and 11 with the binding agent used to bond or unite the same are first pressed together under the influence of heat, all in the known manner, to form the two-ply sheet shown in Fig. 2, and then this sheet and sheet 12 with a suitable binding agent interposed between sheet 12 and the unprinted face of sheet 11 are pressed together under the influence of heat to complete the three-ply sheet shown in Fig. 3. For the described heating and pressing together a heated press may be used, and binding agents suitable for use are well known to those skilled in the art of bonding such materials in the described manner.

From the flat, three-ply, laminated sheet thus formed, and comprising the three adherently united or bonded laminae as shown in Fig. 3, several character-bearing three-ply laminated and concaved disks of the construction shown in Figs. 6, 7 and 8 are formed.

Referring to Figs. 4, 5 and 6, each such three-ply concaved disk is formed by first punching from the flat, laminated three-ply sheet 10—11—12 (as illustrated by Figs. 4 and 5) a flat, circular, laminated, three-ply disk 10^a, 11^a, 12^a with the printed character or indicia 13 appropriate for a single key appearing on said flat disk and preferably approximately centrally located thereon, and thereafter forming this

punched out, flat, circular disk (shown in Fig. 5) by the application thereto of heat and pressure (as by pressing the disk between suitably shaped forming dies of a heated forming or die press) to the concaved or dished form shown in Figs. 6 to 9, in which the character or indicia 13 is visible at the concave face of the finished character-bearing disk thus formed. These formed disks may be punched out of the flat sheet and formed one at a time, or all or any part of the total number formable from the three-ply sheet may be punched out and formed at one time.

It will be observed that there is thus provided a three-ply, laminated, concaved or dished indicia-bearing card or disk for a typewriter key comprising an upper transparent lamina or ply 10^b of cellulosic material or composition, a bottom or backing lamina or ply 12^b of stiff but formable sheet metal, and an intermediate opaque lamina or ply 11^b of cellulosic material, all adherently bonded or connected, and which laminated card or disk is one which has been molded or pressed from a flat form (preferably by application of heat as well as pressure) into a dished or concaved form in which the transparent lamina or ply is at the concave face of the finished disk or card and the character 13 is exposed to view at said concave face through said transparent lamina or ply.

An improved typewriter key including the improved indicia-bearing card or disk is shown in Figs. 7, 8 and 9. Referring particularly to these views of the drawing, 14 designates the usual forward and upturned end of a sheet metal key lever (of known construction) of a typewriting machine, which upturned lever end is formed at its upper end with an integral and flat, horizontally disposed, substantially circular metal key base member 15.

An annular sheet metal retaining and clamping ring 16 for the character-bearing card or disk of the key embraces with its lower portion the periphery of the key base 15. This ring is formed with a plurality of lugs 17 spaced apart around the lower edge of said ring and bent inwardly against the lower face of base 15. Two of the lugs 17 are closely spaced to embrace the upturned end 14 of the key lever, or to engage, or substantially engage, opposite side faces of said lever end, as shown in Figs. 7 and 9.

The retaining and clamping ring 16 is formed, around its upper edge, with an integral inwardly extending retaining or clamping flange 16^a which overhangs the laminated character-bearing disk 10^b, 11^b, 12^b at the periphery of the latter and clamps said disk to a spacing washer or supporting ring 18 which is preferably formed of paper or paper stock. Washer or ring 18 is seated on the upper face of key base member 15 with its periphery engaged by the retaining ring 16 and serves to support the concaved character-bearing card or disk adjacent the periphery of the latter.

The thickness of the paper washer or ring should be such that the card or disk is securely clamped against accidental rotation, with the lowest part of the bottom of the card or disk contacting or, preferably, slightly spaced from key base 15. The use of a paper washer or ring 18 contributes to increased friction between the surfaces clamped together, preventing accidental turning of the card or disk relatively to the key base member 15.

Character-bearing concaved disks or concaved composite laminated key cards constructed and

made as described may be produced in quantity and very economically with substantially no variation in the degree of concavity of the laminated disks or cards, as contrasted with wide variations in concavity between concave character-bearing disks or cards formed from two-ply sheets of cellulosic material, such as shown in Fig. 2 even when the latter are all formed from a single two-ply sheet.

The improved key cards or disks, when in use in keys, are also substantially wholly resistant to change of form by any such changes in humidity and temperature as are likely to be encountered in use of a typewriting machine. The improvements also provide very thin, light, stiff and stable laminated character-bearing key cards or disks.

The use of the very thin sheet metal backing ply formed of stiff but deformable sheet metal of the nature of thin sheet steel or thin sheet brass, which can be pressed to a desired imparted form but has high resistance to change of imparted form, permits also the use of extremely thin disk-like plies of amorphous cellulosic material, much more thin than could possibly be used with a two-ply card of cellulosic material. The resistance of the stiff sheet metal ply to deformation from a given dished form imparted thereto is so great as to entirely overcome or substantially entirely overcome any tendency of the cellulosic plies to curl up, flatten out or otherwise deform, under the influence of internal warping or other stresses in said cellulosic plies tending to change the pressed shape imparted to the laminated key card or disk.

What I claim is:

1. A thin and shape retaining typewriter key card of light weight comprising a concavo-convex disk consisting of three thin and superimposed laminae permanently adhesively bonded face to face, the lamina at the concave side of the disk being a transparent lamina of cellulose acetate, the intermediate lamina being an opaque lamina of cellulose nitrate, the lamina at the convex side of the disk being a lamina of stiff permanently formable sheet metal, such as sheet steel or sheet brass, one of said cellulose laminae bearing a key identifying indicium visible through and covered by the transparent lamina, the total thickness of the card being approximately .0275 inch.

2. A typewriter key card comprising a concavo-convex disk having three superimposed laminae permanently adhesively bonded face to face, the lamina at the concave side of the disk being a transparent lamina of amorphous cellulosic sheet material, the intermediate lamina being an opaque lamina of amorphous cellulosic sheet material and having on its concave face a key-identifying indicium covered by and visible through the transparent lamina, said cellulosic laminae being inherently highly subject to distortion by internal stresses, and the lamina at the convex side of the disk being of stiff permanently formable sheet material inherently substantially free from internal distorting stresses and inherently highly resistant to distortion by internal stresses in the cellulosic laminae.

3. A typewriter key card as claimed in claim 2, in which the lamina at the convex side of the disk is of stiff permanently formable sheet metal having a thickness of approximately .0075 inch, and each of the other two laminae has a thickness of approximately .010 inch.

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