PLATEN HAVING MOLDED TUBULAR PORTION, END WALL AND RATCHET
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ABSTRACT OF THE DISCLOSURE

The platen of a typewriter or calculating machine comprises a bell-shaped carrier of synthetic plastic material which is permanently and non-rotatably connected with a shaft and has an end wall provided with an integral platen ratchet. The tubular portion of the carrier is surrounded by an elastic cylindrical backstop and its interior is provided with stiffening ribs which engage the shaft to center the backstop. The carrier is molded onto or otherwise formed directly on the shaft, and its end wall has an internal annular collar which extends into a complementary groove of the shaft to hold it against axial movement.

Background of the invention

The present invention relates to platens for typewriters, calculating machines and like machines wherein types are caused to strike against an elastic backstop. The invention further relates to a method of producing a platen.

Presently known platens for typewriters or calculating machines comprise a sleeve which is connected with the platen shaft by two annular flanges, and one of these flanges is pinned or bolted to a platen ratchet which cooperates with a customary line space pawl. The ratchet and the flanges are provided with registering bores for the shaft. Washer-like retainers are provided at the outer sides of the ratchet and the other collars to hold the collars and the ratchet in selected axial positions. The sleeve is normally glued or screwed to the collar and is telescopically into a customary cylindrical backstop which consists of elastomeric material and takes up the impact of type in response to depression of keys.

A serious drawback of presently known platens is that their component parts must be manufactured in separate machines and that the manufacture of such components requires a high degree of precision. A conventional platen comprises a minimum of six separately produced parts plus a number of screws, pins, bolts and other auxiliary components which are used to fix the collars, the ratchet and the retainers on the shaft. Additional expenses arise in connection with storing, sorting, testing, transporting, cataloguing, maintenance and other processing of the aforementioned parts. Space parts must be available at the manufacturing plant as well as in the repair shop and must be carried along by repairmen. Additional costs arise in connection with bookkeeping and other work to keep track of the parts.

It is an object of my invention to provide a novel and improved platen which comprises a greatly reduced number of parts and which can be assembled with considerable savings in time and by resorting to relatively simple machinery.

Another object of the invention is to provide a platen wherein the ratchet need not form a separate component part and wherein the ratchet may be permanently secured to the shaft.

A further object of the invention is to provide a platen wherein the number of component parts is but a small fraction of component parts in presently known platens for typewriters or the like.

An additional object of the invention is to provide a platen wherein all component parts form an integral unit and which can be used as an inexpensive and superior substitute for presently known platens.

A concomitant object of the invention is to provide a novel method of producing a platen.

Another object of the invention is to provide a method according to which the shaft need not be bolted, screwed, or analogously fastened to the remaining component parts of the platen.

Summary of the invention

One feature of the present invention resides in the provision of a method of assembling platens for typewriters or the like wherein a shaft is surrounded by a substantially bell-shaped carrier having an annular end wall provided with an integral platen ratchet. The method comprises forming the carrier of a single piece of synthetic plastic or metallic material in a mold wherein the shaft is received in the mold cavity so that, after the material sets, the carrier is permanently connected with the shaft, and applying an elastic cylindrical backstop around the carrier. The shaft is preferably provided with one or more annular grooves and a portion of the material of the end wall of the carrier is forced into such grooves or grooves provided with internal stiffeners in the form of ribs or rails which extend inwardly from its tubular portion and engage the shaft to center the backstop. At least one terminal portion of the shaft may be provided with a platen knob, preferably by introducing the one terminal portion into a mold and admitting into the mold synthetic plastic material which, after setting, forms the platen knob. The terminal portion may be milled or knurled prior to formation of the knob.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved platen itself, however, both as to its construction and the mode of producing the same, together with additional features and advantages thereof, will be best understood upon perusal of the following detailed description of certain specific embodiments with reference to the accompanying drawing.

Brief description of the drawing

FIG. 1 is a substantially axial section through a platen which embodies one form of my invention, the section being taken along the line I—I of FIG. 4; FIG. 2 is an end elevational view of the platen as seen from the right-hand side of FIG. 1; FIG. 3 is an axial section through the platen substantially as seen in the direction of arrows from the line III—III of FIG. 4; FIG. 4 is an end elevational view of the platen as seen from the left-hand side of FIG. 1; and FIG. 5 is a perspective view of the platen, portions of the carrier and of the backstop being broken away.

Description of the preferred embodiments

Referring to the drawing in detail, the improved platen 1 comprises an elongated shaft 7 having two terminal portions 9 and 12. The terminal portion 12 is knurled or...
milled and can be non-rotatably introduced into an internally splined platen knob which is not shown in the drawing. Alternatively, and as explained hereinbefore, the milled plastic material 13 may be introduced into a suitable mold and a mass of deformable synthetic plastic material is thereupon introduced into the mold cavity to form, after setting, a knob which is permanently connected with the shaft 7. The other terminal portion 9 can be knurled or milled in the same way as the terminal portion 12 and can be connected with a second platen knob.

The platen 1 further comprises a substantially bell-shaped carrier 2 which consists of hardened synthetic plastic material and comprises a tubular portion 2b one end of which is closed by an end wall 2a having an outwardly extending portion provided with an integral platen ratchet 4. The end wall 2a has an inwardly extending annular collar which is accommodated in a circumferential groove 8 of the shaft 7 so that the latter is permanently connected with the carrier 2 and is held against axial and angular movement with reference to the end wall 2a. The groove 8 may consist of several arcuate sections so that the collar of the end wall 2a positively prevent rotation of the carrier 2 on the shaft 7. The exposed outer face of the end wall 2a is provided with an annular recess 5 which is surrounded by the ratchet 4. This recess is necessary to prevent the formation of burrs during injection of synthetic plastic material which forms the carrier 2.

The end wall 2a is further provided with a tubular extension 3 which extends toward the open end of the tubular portion 2b. The extension 3 insures satisfactory centering of the tubular portion 2b and contributes to rigidity of the carrier 2. Furthermore, the internal surface of the extension 3 is in face-to-face abutment with the adjoining portion of peripheral surface on the shaft 7 to establish a satisfactory connection between the shaft and the carrier 2.

It will be seen that the tubular portion 2b of the carrier 2 is provided with inwardly extending stiffeners in the form of elongated ribs 6 which extend all the way between the end wall 2a and the open left-hand end of the tubular portion 2b. The ribs 6 have concave internal surfaces which abut against and follow the outline of the shaft 7 in the region between the extension 3 and the left-hand end of the tubular portion 2b. These ribs enter the backstop 13 on the shaft 7 and prevent deformation of the carrier 2. In the illustrated embodiment, the carrier 2 is provided with four parallel ribs which extend substantially radially toward the axis of the shaft 7 and are integral with the extension 3. However, the ribs 6 need not extend exactly radially of the shaft. For example, and in order to eliminate or reduce internal stresses in the material of the carrier 2, the planes of the ribs 6 may be parallel to the axis of the shaft 7 or extend substantially tangentially of the shaft. The thickness of the ribs 6 decreases in a direction away from the end wall 2a.

The terminal portions 9 and 12 of the shaft 7 are formed with additional annular grooves 11 and at least one of these terminal portions is further provided with a cylindrical bearing surface 10 which is received in a suitable socket of the carriage in a typewriter.

It will be seen that the improved platen can be assembled of a small number of parts, namely, of the shaft 7, carrier 2, and backstop 13. Furthermore, the step of manufacturing the carrier 2 may be combined with the step of assembling it with the shaft 7. For example, the shaft 7 may be placed into a suitable mold whose cavity is then filled with synthetic plastic or metallic material to form the carrier 2 including the tubular portion 2b, end wall 2a, ratchet 4, extension 3 and ribs 6. When the material hardens, it is removed from the mold and the resulting carrier 2 is permanently connected with the shaft 7 because some material of the end wall 2a penetrates into the groove 8 and forms an internal collar which prevents axial movements of the carrier on the shaft. The inner surfaces of the ribs 6 are preferably concave and are in direct face-to-face abutment with the peripheral surface of the shaft 7. In the final step, the tubular portion 2b is telescoped into the cylindrical backstop 13. As stated before, the terminal portion 9 of the shaft 7 may be knurled or milled in the same way as the terminal portion 12 to take a second platen knob.

An important advantage of the just outlined method of producing and assembling the platen 1 is that the parts 2, 7 and 13 can be connected to each other by resorting to screws, pins, washer-like retainers and analogous fastening and/or locating devices. This simplifies the work of a repairman and reduces the number of parts which must be held in storage.

As stated before, the platen knob can be molded directly around the terminal portion 12 of the shaft 7. However, it is equally within the purview of my invention to produce the knob in a separate operation and to slip it onto the terminal portion 12. The knob can be made of the same material as the carrier 2, provided that the latter consists of a plastic whose coloring is suitable for the knob. The two mold hardening and shaping operations (carrier 2 and platen knob or knobs) can be carried out simultaneously.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features which fairly constitute essential characteristics of the generic and specific aspects of my contribution to the art and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

1. In a platen for typewriters or the like, a substantially bell-shaped carrier unit including a tubular portion, an annular end wall at one end of said tubular portion only and a platen ratchet on said end wall, said tubular portion, annular end wall and platen ratchet made in one piece; a shaft coaxially received in and having terminal portions at least one of which extends beyond said carrier; and a cylindrical backstop surrounding said tubular portion of said carrier.

2. A platen as defined in claim 1, wherein said end wall has an outer side facing away from the other end of said carrier and said ratchet is provided at said outer side.

3. A platen as defined in claim 2, wherein said end wall comprises a tubular extension surrounding a portion of said shaft in the interior of said tubular portion.

4. A platen as defined in claim 1, wherein said tubular portion comprises inwardly extending stiffeners which engage said shaft.

5. A platen as defined in claim 4, wherein said stiffeners are constituted by ribs extending substantially in the axial direction of said shaft.

6. A platen as defined in claim 4, wherein said stiffeners extend substantially all the way between said end wall and the other end of said tubular portion.

7. A platen as defined in claim 1, wherein said end wall comprises an internal annular collar extending into an annular groove provided in the external surface of said shaft.

8. A platen as defined in claim 1, wherein at least one terminal portion of said shaft is milled to receive a platen knob.

9. A platen as defined in claim 1, wherein said terminal portions of the shaft are provided with annular grooves.

10. A platen as defined in claim 1, wherein at least one of said terminal portions is provided with a cylindrical bearing surface.

(References on following page)
References Cited

UNITED STATES PATENTS

1,036,947 8/1912 Yaw 197—144 XR
1,749,393 3/1930 Pfimlin 29—132 XR
1,759,192 5/1930 Fulk 29—115 XR
1,804,160 5/1931 Froehlich 197—144 XR
2,073,528 3/1937 Safford 197—144 XR
2,185,766 1/1940 Higby 29—132 XR

2,536,323 1/1951 Spencer 29—129.5
3,006,061 10/1961 Zahradnik 197—144 XR
3,184,828 5/1965 Dames 18—29 XR
3,293,728 12/1966 Hill 29—132
3,500,835 1/1971 Barr 29—132 XR

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