Sept. 11, 1934. C. A. FUCHS ET AL 1,973,057

PRINTING INSTRUMENTALITY FOR TYPEWRITING MACHINES

Filed May 22, 1931

Fig. 1.

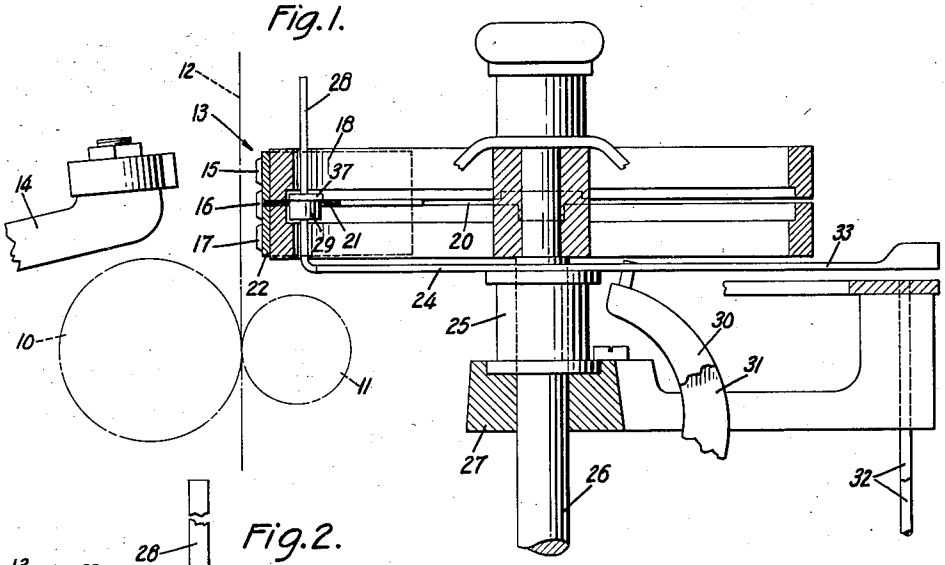
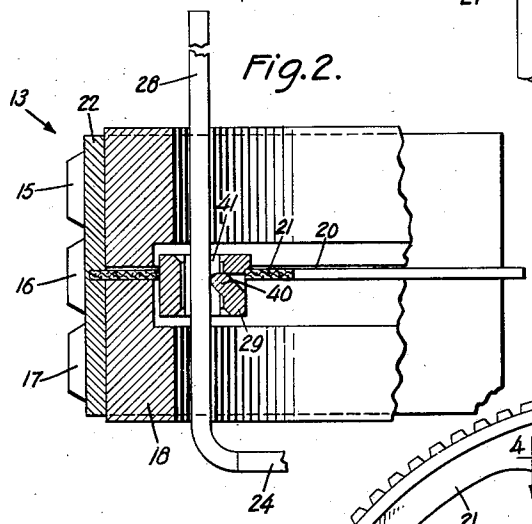


Fig. 2.



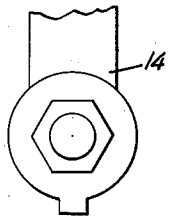


Fig. 3.

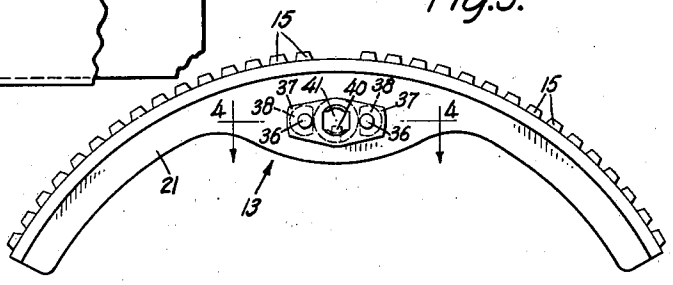
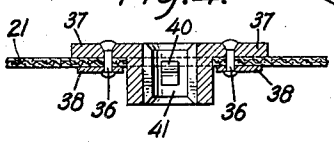


Fig. 4.



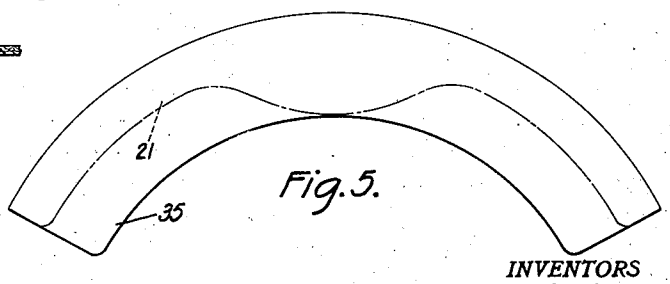


Fig. 5.

INVENTORS
Charles A. Fuchs and
Henry Resch.
BY John Waldheim
ATTORNEY

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PRINTING INSTRUMENTALITY FOR TYPEWRITING MACHINES

Charles A. Fuchs, Hollis, N. Y., and Henry Resch, Bayonne, N. J., assignors, by mesne assignments, to Ralph C. Coxhead Corporation, New York, N. Y., a corporation of Delaware

Application May 22, 1931, Serial No. 539,181

5 Claims. (Cl. 197—48)

This invention relates to improvements in typewriting machines and more particularly to printing instrumentalities therefor.

The invention is herein illustrated in connection with a machine known as the Varityper which is provided with a type carrier or shuttle ordinarily composed of hard rubber and mounted on a ring-like support or anvil about which it is operable; the type carrier being provided with a metal web extending from the middle thereof through a slot in the support for guidance and for attachment to an actuating lever.

An object of the invention is to make a type carrier of a phenol condensation product such as bakelite, condensite and the like, to render it more durable, to produce sharper printing of the types and which is lighter than the one used heretofore, to decrease the inertia thereof, thus decreasing the resistance to the key levers and accordingly increasing the speed of operation of the machine.

In carrying out the invention the web, by which the type carrier is operated, is previously formed and then bonded or united to the type segment, while the latter is being formed in a suitable mold.

A feature of the invention relates to means to prevent the shuttle from moving outwardly, due to the centrifugal force thereof, from the face of the cylindrical anvil upon which it is supported. This overcomes the objection of noise and double printing which has been experienced due to the looseness between the type shuttle and the anvil.

To this end the bushing on the type shuttle has therein a tongue which engages the rear face of a finger extending through said bushing from the shuttle actuator so that the radial or outward movement of the type shuttle is prevented.

Other features and advantages will hereinafter appear.

In the drawing which forms part of the specification,

Fig. 1 is a sectional, side view of a portion of the machine showing the novel type shuttle applied thereto;

Fig. 2 is a detail sectional view, on a larger scale, through the type shuttle and the bushing thereon;

Fig. 3 is a top plan view of the type shuttle and the hammer;

Fig. 4 is a vertical section of the type shuttle taken on the line 4—4 of Fig. 3; and

Fig. 5 is a detail view of the blank which forms the operating web of the type shuttle.

Similar reference characters represent similar parts throughout the specification.

The machine includes feed rollers 10 and 11, on a carriage (not shown) by which a work sheet 12 is fed upwardly between a type carrier 13, at the front of the work-sheet, and a hammer 14 to co-operate therewith; the hammer being operated, in the usual manner, upon the actuation of key levers (not shown) to print against any one of the types 15, 16 or 17 arranged in three rows, on the type carrier, the work-sheet 12 being interposed between the hammer and the type carrier.

The type carrier or shuttle 13 is mounted on a ring-like support or anvil 18 to which the blow of the hammer 14 is transmitted. Said anvil has a slot 20 through which extends a guide web or actuating segment 21 from a type segment 22 of the shuttle 13, which is formed in a manner hereinafter explained.

The shuttle 13 is provided with two groups of types, one group at each side of the hammer 14 (Fig. 3), and it is operable by a lever or actuator 24 from a central position to either side of the machine to carry the desired types to the printing point opposite the hammer. The shuttle actuating lever is pivotally supported by a sleeve 25 to swing about a vertical shaft 26 suitably supported in the machine frame 27; said lever having a vertical finger 28 engaging in a bushing 29 on the fin or flange 21. The shuttle actuator 24 is operable by any one of two vertically disposed arms 30 and 31 of frames (not shown) actuated by the usual key levers. Indexing pins 32 are also operable by the key levers to project them into the path of an arm 33 of the actuator 24 to stop the latter and thus register the selected type at the printing point.

Heretofore, the type segment 22 of the shuttle 13 consisted of hard rubber, the rubber being vulcanized on a perforated metal segment. The guide web was also composed of metal and was attached to the shuttle through the medium of the metal segment which also reinforced the type segment. This construction provided a relatively heavy shuttle, its weight being about sixteen hundredths (.16) of a pound. It will be understood that the weight of the type shuttle is a factor upon which depends the speed of actuation of the machine since the inertia thereof must be overcome at the actuation of each key lever.

The present invention provides a shuttle which is made of material which is lighter and more durable than that used heretofore, in which the metal reinforcing segment is no longer necessary, and in which the actuating flange is of simpler construction than heretofore. In this novel type shuttle the weight thereof is only nine hundredths (.09) of a pound which greatly reduces the inertia thereof with a result that the speed of the machine (words per minute) is greatly increased. The touch of the key levers is also about 30% lighter than heretofore.

The type segment 22 of the shuttle is molded of phenol condensation product and during this molding process the actuating segment or guide flange 21 is bonded or united with the type segment, during the molding process, to form an integral structure, said guide segment 21 being made of thin sheet material composed of cloth impregnated with phenol condensation product, the cloth being effective to resist breaking of the guide segment, one form of said material being known in the trade as bakelite molded cloth.

One advantage of making the guide flange 21 of this kind of material, in addition to the advantage of reducing the weight of the shuttle, is that a variation in the coefficient of expansion and contraction of the materials is eliminated. This coefficient in phenol condensation product differs sufficiently from that of other materials, so that if this material were used for the type segment 22 and another kind of material were used for the guide segment 21 there would be effected a change of shape of the type shuttle, while cooling, so that the shuttle would conform to the shape of the anvil 18.

The guide flange 21 is formed, out of a segment 35, after the molding operation; the segment 35 having the shape, as illustrated in Fig. 5, for the purpose of locating and holding it in the mold used in its manufacture.

The bushing 29, in which the finger 28 of the shuttle actuator engages, is secured to the flange 21 by rivets 36 passing through flanges 37 extending from said bushing. Two washers 38 are provided, at opposite sides of the flange 31, against which the rivets 36 are headed.

Heretofore the type shuttle has had freedom of movement, slightly, away from the face of the anvil 18, due to its centrifugal force, while operating. This has caused double printing, once as the hammer met the type shuttle while away from the face of the anvil and again when the shuttle struck the anvil. This also made the machine noisy.

To prevent the type segment 22 of the shuttle from leaving the face of the anvil 18, or in other words to cause the type shuttle to always lie close to the anvil, there is provided in the bushing 29 a nose 40 which may be pressed into the aperture 41 of said bushing to engage the vertical portion or finger 28 of the actuating lever 24. With this arrangement the nose 40 merely presses on the finger 28 during the operation of the shuttle and does not produce any friction which hinders the operation of the shuttle. The nose 40 is rounded so as to overcome any tendency of sticking to the finger 28 during case shifting movements of the type shuttle, which may otherwise result in disalignment of printing because of the loseness of the web 21 in the slot 20, which looseness is desirable for freedom of actuation of the type shuttle.

Thus it should be understood that this frictionless means of holding the shuttle close to the anvil, and the decrease in the weight of the shuttle by making it of phenol condensation product, make the touch of the key levers about 30% lighter and increase the speed of the machine more than 33%. It should also be understood that the life of the shuttle made of phenol condensation product is at least three times longer than that of the hard rubber shuttle used heretofore. Further my novel shuttle, because of the material of which it is composed, is not subject to the attack of the ingredients of stencils as is the rubber shuttle. The new shuttle may also be oiled, without injury thereto, to reduce friction thereof on the anvil to a minimum.

While certain preferred embodiments of the invention have been described, it will be understood that changes in the form, arrangements, proportions, sizes and details thereof may be made without departing from the scope of the invention as defined in the appended claims.

We claim:—

1. In a typewriting machine, the combination of printing instrumentalities including a type carrier, and a hammer to co-operate therewith, said type carrier comprising a type segment composed of phenol condensation product, and a flange composed of fabric impregnated with phenol condensation product, the fabric serving to resist breaking of the flange, said flange being united with said type segment, and means to actuate said type carrier.

2. In a typewriting machine, the combination of printing instrumentalities including a type carrier, and a hammer to co-operate therewith, said type carrier comprising a type segment composed of phenol condensation product, and a flange composed of fabric impregnated with phenol condensation product, the fabric serving to resist breaking of the flange, said flange being united with said type segment, a metal bushing secured to said flange, and an actuating lever to engage said bushing.

3. In a typewriting machine, the combination of a curved type carrier, a curved anvil to support the type carrier, a hammer to co-operate with the type carrier, a flange on said type carrier to support the latter on said anvil, a bushing on said flange, said bushing having an aperture therein, a lever having a portion extending into the aperture of said bushing to actuate said type carrier, said portion being of smaller dimension than said aperture, and a tongue pressed in from the body of said bushing and extending into said aperture to engage said lever to hold the type carrier close to the anvil while the type carrier is being operated.

4. In a typewriting machine, the combination of a vertically disposed anvil, a segmental type shuttle supported on the outer face of the anvil, a hammer to co-operate with the type shuttle, a flange extending through a horizontal slot in the anvil, a bushing on said flange, an inwardly extending finger on said bushing, a horizontal lever actuable about the vertical axis of said anvil to operate said shuttle, a vertical finger on said lever extending into said bushing and engaging the first mentioned finger to counteract the centrifugal force of the shuttle while operating and thus prevent the shuttle from leaving the face of the anvil.

5. In a typewriting machine, the combination of a type shuttle, an anvil to support the type carrier, an element to co-operate with the type carrier to print on a work-sheet, the type carrier comprising a segmental type member and a segmental guide flange to engage the anvil, means including an actuator to engage the guide flange to actuate the shuttle, said flange having a substantially rectangular aperture therein in which the actuator may occupy any one of several positions fore-and-aft of the machine, and a finger on said flange which may be bent to properly engage the actuator to cause the shuttle to hug the anvil while said shuttle is being operated.

CHARLES A. FUCHS.
HENRY RESCH.