

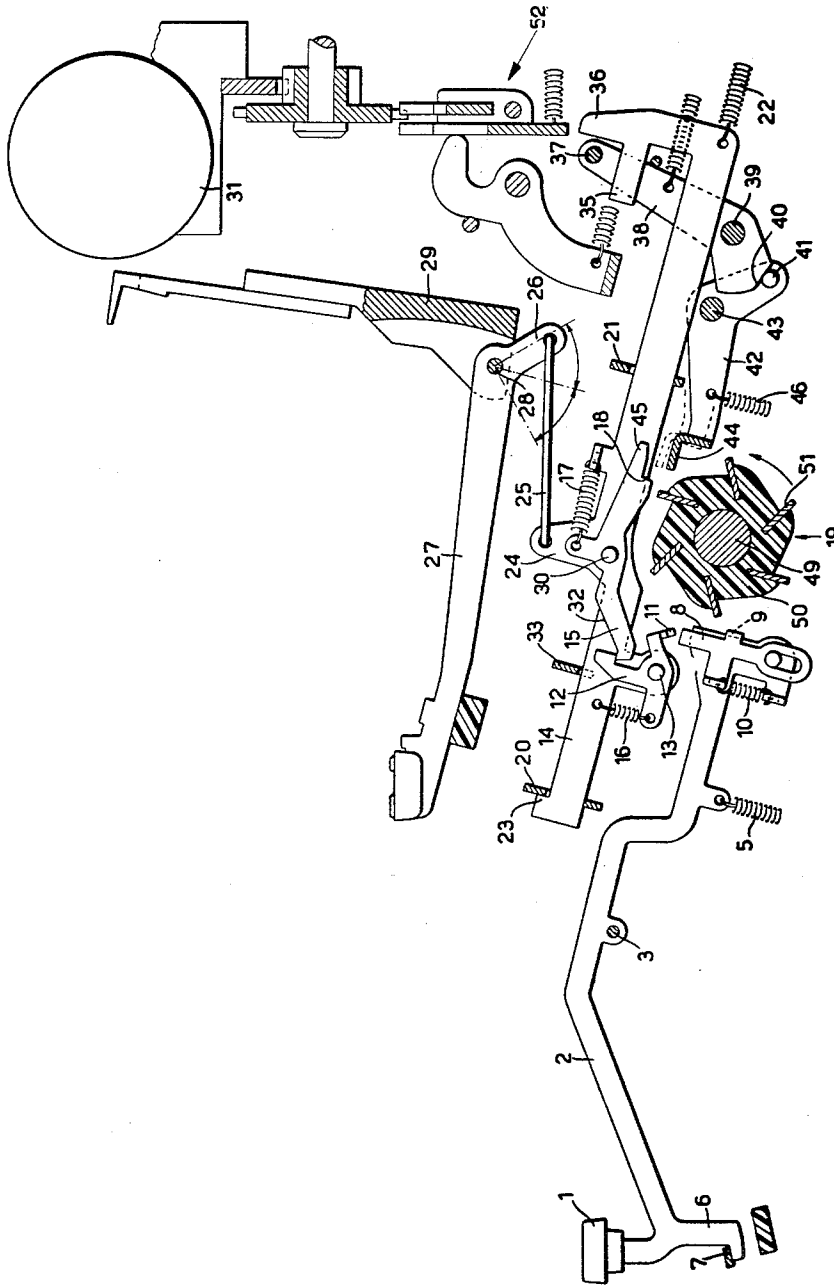
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POWER-OPERATED TYPE ACTION FOR TYPEWRITERS AND THE LIKE

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POWER-OPERATED TYPE ACTION FOR TYPE- WRITERS AND THE LIKE

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This invention relates to typewriters or the like, wherein a set of type bars are mounted at differential angular positions on a substantially semicircular segment for individual movement towards a common printing point.

The invention is more particularly concerned with a power-operated type action of the kind comprising a separate power actuator for each type bar, said actuators being arranged in a single row and being selectively reciprocable to execute substantially equal actuating strokes upon depression of the corresponding key.

In the known machines each actuator is connected to the conventional heel of the associated type bar by the intermediary of one or more pivoted levers, one of said levers having an arm variably formed according to the angular position of the type bar associated with the free end thereof. Due to the substantially equal actuating strokes of the actuators, the end of said variably formed arms are moved through a variable extent whereby a variable force will be imparted to the several type bars.

To partially obviate this disadvantage it has been proposed either to make the heel of the several type bars of variable length or to have said levers fulcrumed on different pivots with the result of increasing the cost of the machine.

The primary object of the invention is to provide a novel power-operated type action wherein a constant force will be imparted to the type bars irrespective of their differential angular positions.

A further object of the invention is to provide a type action easy to be manufactured and assembled.

Another object of the invention is to provide a novel type action controlling device to avoid the several type bars to jam at the printing point.

Another object of the invention is to provide a novel power snatch roll adapted to resiliently drive said actuators.

According to the invention, in a power-operated typewriter having a set of type bars, a substantially semicircular segment mounting said type bars at differential angular positions for individual movement towards a common printing point, each one of said type bars comprising a heel operable through an angle for rocking said type bars, and a separate power actuator for each one of said type bars, I now provide means for mounting said actuators in a single row for substantially rectilinear reciprocation according to a direction substantially perpendicular, to the bisector of said angle, said power actuators being selectively adapted to execute substantially equal actuating strokes; I further provide an element on each actuator variably formed according to the angular position of its associated type bar, and a member connected to the element of each power actuator to directly transmit its actuating stroke to the heel of its associated type bar, whereby a constant force will be imparted to said type bars irrespective of their differential angular positions.

Further objects, features and advantages of the invention will become apparent from the following detailed

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description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings showing a partial right hand longitudinal sectional view of a typewriter embodying a power-operated type action according to the invention.

With reference to the drawings, the numeral 27 indicates a type bar of a set of type bars which are mounted at differential angular positions on a substantially semicircular segment 29 by being pivoted on a pivot wire 28 for individual rotation towards a common printing point on a conventional platen 31. Each type bar 27 comprises a heel 26 which is operable through an angle of substantially 90 degrees.

The power operated type action of the typewriter comprises a separate power actuator for each one of said type bars, means being provided for slidably mounting said actuators in a single row for rectilinear reciprocations. More particularly, each one of said power actuators is formed of a slide 14 slidably mounted on a pair of stationary comb plates 20, 21 for rectilinear reciprocation according to a direction substantially perpendicular to the bisector of the angle covered by the movement of the heel 26 of the associated type bar 27. Each slide 14 is provided with a shoulder 23 normally urged by a spring 22 to contact the comb plate 20.

Integral with each slide 14 is an element such as a projection 24 variably formed according to the angular position of its associated type bar. More particularly, said projection 24 is variably bent and sized, a member such as a link 25 being connected to the projection 24 of the actuator 14 to directly transmit its actuating stroke to the heel 26 of the associated type bar. The link 25 is substantially parallel to the direction of the sliding movement of the actuator 14, whereby, upon shifting the segment 29 from its lower case position to its upper case position the link 25 will transmit the actuating stroke to the type bar under like conditions.

Associated with the set of power actuators 14 is a set of keys 1 each mounted on a key lever 2 pivoted at 3 in the machine frame. Each key lever 2 is normally urged by a spring 5 to contact a stationary cushion strip 7 by means of a suitable projection 6. A push rod 8 is pin-and-slot connected to the rear end of the lever 2 and is urged by a spring 10 to contact the lever 2 by means of a bent lug 9. The upper end of the rod 8 is adapted to cooperate with a lug 11 of a latch 12 fulcrumed on a pivot 13 secured to the slide 14. By the urge of a spring 16 the latch 12 normally engages a snatch element or pawl 15 fulcrumed on a pivot 30 of the slide 14 and connected thereto by a spring 17. The pawl 15 is formed with a shoulder 18 adapted to cooperate with a snatch roll such as a toothed drum 19 continuously driven by an electric motor, not shown in the drawings. The pawl 15 is further provided with an upper inclined edge 32 adapted to cooperate with a stationary bar 33.

Upon depressing a selected key 1 the corresponding push rod 8 is raised and the latch 12 is rocked counterclockwise. The latch 12 thus releases the pawl 15 which is rocked clockwise by its spring 17 to engage the shoulder 18 with the teeth of the drum 19. The latter now moves the pawl 15 and the slide 14 forwards (leftwards in the drawings) to execute its rectilinear actuating stroke, whereby it will be apparent that the slides 14 are selectively reciprocable to execute substantially equal actuating strokes. The link 25 in turn will directly transmit the actuating stroke of the slide 14 to the heel 26 which is thus operated for rocking the associated type bar 27 through an angle substantially of 90 degrees to effect an impact on the platen 31.

Near the end of the actuating stroke the inclined edge 32 of the pawl 15 abuts the stationary bar 33 and is rocked counterclockwise, whereby it is disengaged from

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the drum 19 and related by the latch 12. Thereupon the spring 22 will return the slide 14 backwards to rest.

If the key is held depressed, during the return stroke of the slide 14 the lug 11 of the latch 12 will frontally meet the upper end of the push rod 8 which is thus rocked clockwise against the urge of the spring 10, whereby a repeated impact will be prevented.

It will be apparent that, due to the rectilinear stroke of the slide 14, the upper end of the projection 24 will be always moved through a constant extent equal to said stroke irrespective of the size of the projection. Consequently, a constant force will be imparted to the type bars 27 irrespective of their differential angular positions on the segment 29.

Since the actuating stroke of the actuators 14 is constant, the conventional escapement mechanism of the machine, generally indicated by 52, will suitably be operated by the actuators themselves, instead of by the type bars mounted in the shiftable segment 29. To this end the slides 14 are provided with a projection 35 adapted to engage a suitable universal bar towards the end of the actuating stroke to operate the escapement mechanism.

Furthermore, since the actuating stroke of the actuator 14 is directly transmitted to the heel 26 without being enlarged by the intermediary of a suitable lever, the actuating stroke of the actuator should be longer than the actuating stroke of the actuator of conventional power-operated type actions. Therefore, the toothed drum 19 should have a greater diameter, whereby the drum suffers a minor wear, while the operation of the actuator is less affected by said wear.

Finally, since a tooth of the drum 19 will push the pawl 15 through a great angle at high speed, towards the end of the actuating stroke of the slide 14 the type bar will have a speed greater than the component according to the direction of said stroke of said tooth whereby the shoulder 18 will leave the drum 19 and may be easily lifted by the bar 33, avoiding the wear due to the disengagement from the drum 19.

The typewriter is further provided with a control device adapted to prevent the type bars from jamming on the printing point if two or more keys are depressed substantially simultaneously. To this end there is provided a universal bar means operable by an actuator 14 upon its actuating stroke for preventing the snatch elements 15 mounted on the other actuators from conditioning their associated actuators for reciprocation.

More particularly, the universal bar means comprise a first universal bar 37 which is engageable by a projection 36 of the slide 14 and is secured to a crank lever 38 pivoted on a stationary shaft 39. The crank lever 38 is formed with a cam edge 40 cooperating with a pin 41 of a bail 42 pivoted on a stationary shaft 43. The bail 42 includes a second universal bar 44 comprised in said universal bar means and adapted to cooperate with a projection 45 of each snatch pawl 15, a spring 46 normally urging the universal bar 44 to its lower position.

During the actuating stroke of a slide 14 its projection 36 engages the universal bar 37, thus rocking the crank lever 38 counterclockwise. The cam edge 40 now rocks the bail 42 clockwise and the universal bar 44 is raised into the path of the projections 45 of the pawls 15.

If during said actuating stroke another key 1 is depressed, the corresponding pawl 15 thereupon released will immediately be arrested by the universal bar 44 without engaging the drum 19, said universal bar thus preventing said pawl from conditioning its associated slide 14.

During the return stroke of the slide 14 the universal bar 44 is restored to its lower position by the spring 46 and the previously arrested pawl 15 may be further rocked by its spring 17 to finally engage the drum 19.

It will thus be apparent that the universal bar means 37 and 44 control the timing of the various impacts irrespective of the rhythm according to which the keys are depressed, whereby the typing speed will be increased.

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The toothed drum 19 is formed of an inner metallic shaft 49 with a relatively resilient covering of rubber 50 having a plurality of axial metallic blades 51 inserted therein. The blades 51 thus contact the shoulder 18 resiliently, due to the elastic hysteresis of the rubber 50.

It will be clear that many changes, improvements and modifications may be effected without departing from the limits of the invention. For example, the bar 33 may be shifted rightwards when the motor is off in order to prevent the pawls 15 from being accidentally released. Moreover the member 25 may merely consist of a portion of the element 24, said element being arranged on the right of the heel 26 and directly contacting same.

What I claim is:

1. In a power-operated typewriter, a set of type bars, a substantially semicircular segment mounting said type bars at differential angular positions for individual movement towards a common printing point, each one of said type bars having a heel operable through an angle for rocking said type bars, a separate power actuator for each one of said type bars, means mounting said actuators in a single row for substantially rectilinear reciprocation according to a direction substantially perpendicular to the bisector of said angle, said power actuators being selectively adapted to execute substantially equal actuating strokes, an element on each actuator variably formed according to the angular position of its associated type bar, and a member connected to the element of each power actuator to directly transmit its actuating stroke to the heel of its associated type bar, whereby a constant force will be imparted to said type bars irrespective of their differential angular positions.

2. In a power-operated typewriter as defined by claim 1, the subcombination of a snatch element mounted on each power actuator and operable for conditioning said actuator to be reciprocated, and universal bar means operable by an actuator upon its actuating stroke for preventing the other snatch elements from conditioning their associated actuators.

3. In a power-operated typewriter as defined by claim 1, the subcombination of a snatch roll for driving said actuators, said roll being formed of a metallic shaft with a covering of rubber having a plurality of axial metallic blades inserted therein.

4. In a power-operated typewriter, a set of type bars, a substantially semicircular segment mounting said type bars at differential angular positions for individual movement towards a common printing point, each one of said type bars having a heel operable through an angle for rocking said type bars, a separate power actuator for each one of said type bars, means slidably mounting said actuators in a single row for rectilinear reciprocation according to a direction substantially perpendicular to the bisector of said angle, said power actuators being selectively reciprocable to execute substantially equal actuating strokes, an element integral with each actuator and variably bent and sized according to the angular position of its associated type bar, and a link connected to the element of each power actuator to directly transmit its actuating stroke to the heel of its associated type bar, whereby a constant force will be imparted to said type bars irrespective of their differential angular positions.

5. In a power-operated typewriter as defined by claim 4, the subcombination of a snatch element mounted on each power actuator and operable for conditioning said actuator to be reciprocated, and universal bar means operable by an actuator upon its actuating stroke for preventing the other snatch elements from conditioning their associated actuators.

6. In a power-operated typewriter as defined by claim 4, the subcombination of a snatch roll for driving said actuator, said roll being formed of a metallic shaft with a covering of rubber having a plurality of axial metallic blades inserted therein.

7. In a power-operated typewriter having an escape-

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ment mechanism, a set of type bars, a substantially semi-circular segment mounting said type bars at differential angular positions for individual movement towards a common printing point, each one of said type bars having a heel operable through an angle for rocking said type bars, a separate power actuator for each one of said type bars, means slidably mounting said actuators for rectilinear reciprocation according to a direction substantially perpendicular to the bisector of said angle, said power actuators being selectively reciprocable to execute substantially equal actuating strokes, an element on each actuator variably formed according to the angular position of its associated type bar, a member connected to the element of each power actuator to directly transmit its actuating stroke to the heel of its associated type bar, and a further element on each actuator for operating said escapement mechanism upon its actuating stroke.

8. In a power-operated typewriter having a set of type bars and a separate power actuator for each one of said type bars, the subcombination of a snatch element mounted on each power actuator and operable for conditioning said actuator to be reciprocated, and universal bar means operable by an actuator upon its actuating stroke for pre-

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venting the other snatch elements from conditioning their associated actuators.

9. In a power-operated typewriter having a set of type bars and a separate power actuator for each one of said type bars, the subcombination of a snatch element mounted on each power actuator and operable for conditioning said actuator to be reciprocated, a first universal bar engageable by an actuator upon its actuating stroke, and a second universal bar operable by said first universal bar for preventing the other snatch elements from conditioning their associated actuators.

10. In a power-operated typewriter having a set of type bars and a power actuator for each one of said type bars, the subcombination of a power driven snatch roll for reciprocating said actuators, said roll being formed of a metallic shaft with a covering of rubber having a plurality of axial metallic blades inserted therein.

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