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APPARATUS FOR PRODUCING TYPEWRITTEN MATTER IN TWO TONES

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2 Sheets-Sheet 1

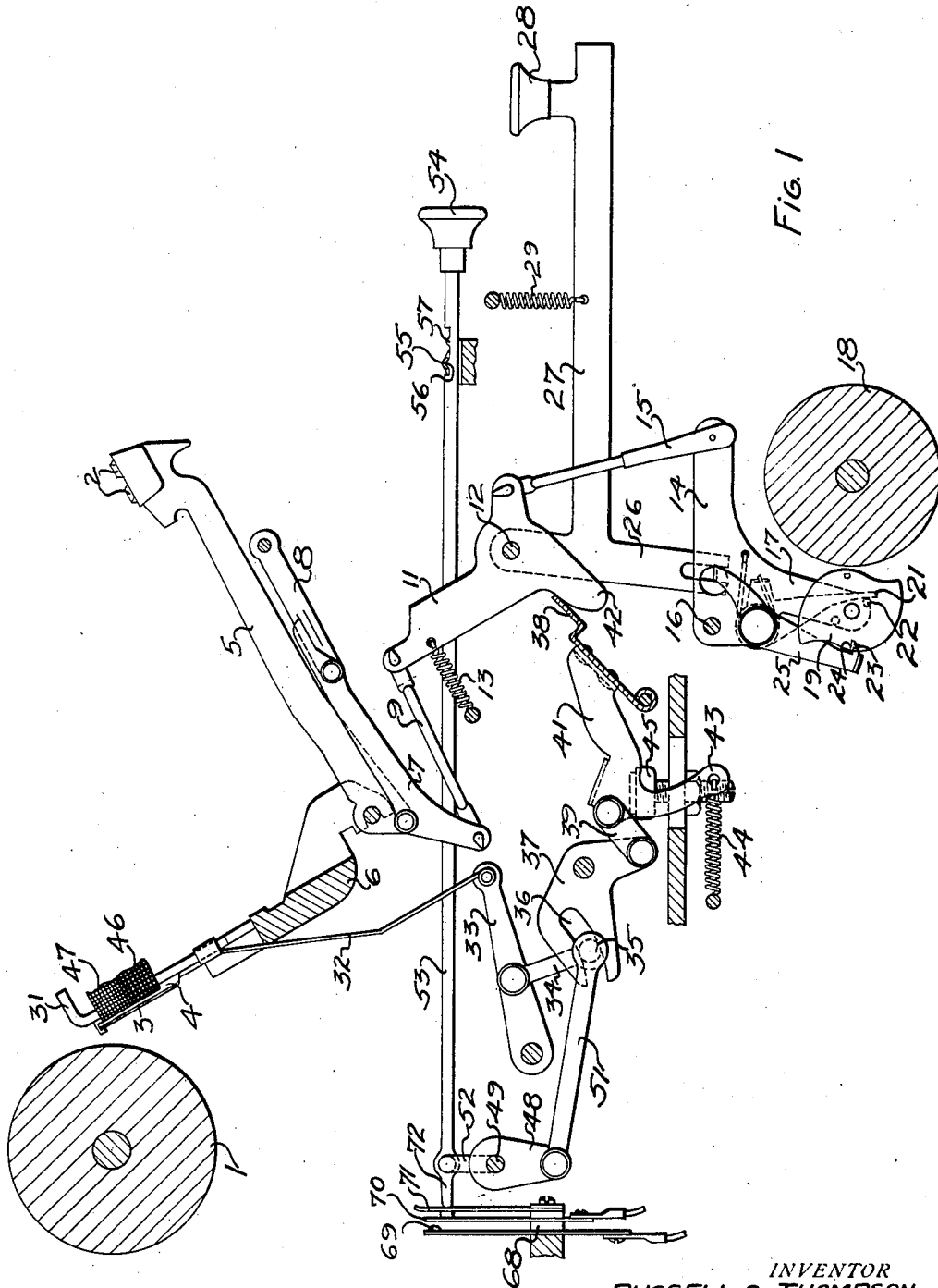


Fig. 1

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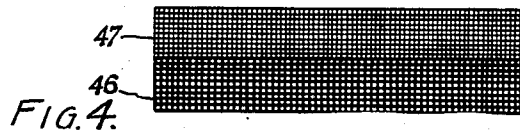
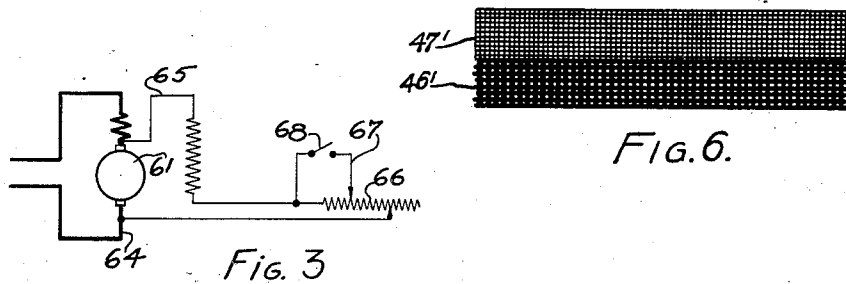
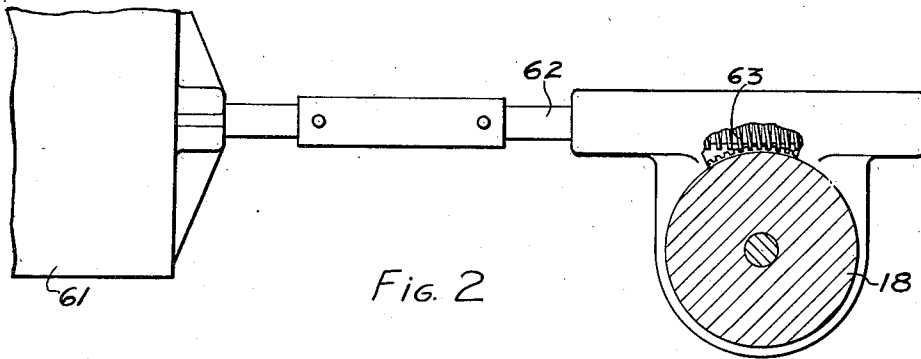
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2 Sheets-Sheet 2



^bA B E F
^aA B E F
Fig. 5

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1,987,276

APPARATUS FOR PRODUCING TYPEWRITTEN MATTER IN TWO TONES

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8 Claims. (Cl. 197—156)

This invention relates to a method and apparatus for producing typewritten matter in two tones on the same machine, that is, typewritten matter in either light or bold faced type for reproduction purposes. In practice, it has been the custom in producing a typewritten page for reproduction in large numbers by the photographic process to write the headings or other matter which is to appear in bold faced type on a typewriting machine having its type bars equipped with broad faced type, that is, type the lines of which are broader or thicker than the standard type usually provided on the machine. The body of the sheet is filled in on a typewriting machine having standard types. Such a procedure not only requires the use of two machines, but often results in inaccuracies resulting from arranging the sheet in the second machine out of proper alinement with the printed matter already appearing thereon. It is the object of this invention to provide a simple method and machine for performing the same, whereby the bold faced typewritten matter may be produced from one portion of a ribbon in a typewriting machine, and the light faced typewritten matter from another portion of the same ribbon, the same types being used for producing both the bold faced and light faced type impressions.

Another object of the invention is to provide a method for producing both bold and light faced typewritten matter on the same machine by increasing the force of impact of the types when the bold faced impressions are being made.

Still another object of the invention is the provision of a typewriting machine having a two-tone ribbon with means for selectively writing from either tone of the ribbon and means operatively connected with said means for varying the force of type impact.

A still further object of the invention is the provision of a power operated typewriting machine having a power driven roller and a two-tone ribbon with shiftable means for selectively writing from either tone of the ribbon and means controlled by said shiftable means for varying the speed of the power driven roller to vary the force of impact of the type.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a transverse vertical section showing

so much of a power driven typewriting machine as is necessary to illustrate an apparatus constructed according to one embodiment of the invention;

Fig. 2 is a fragmentary detail view partly in section of the power driven roller and means for operating the same;

Fig. 3 is a diagram of the wiring of the electric motor shown in Fig. 2;

Fig. 4 is a fragmentary view of a two-tone ribbon;

Fig. 5 shows written characters as may be produced by different portions of the ribbon, and

Fig. 6 is a fragmentary view of a modified form of two-tone ribbon.

Similar reference characters refer to the same part in all the figures of the drawings.

The apparatus illustrated comprises a power driven typewriting machine adapted to produce both heavy or bold and light faced type impressions of the kind illustrated in Fig. 5 of the drawings for use in photographic printing or reproduction. In such reproductions, it is desirable to have the headings and sometimes other matter in the body appear in bold faced type such as shown at *a* in Fig. 5, while the main body of the printed matter appears in light faced type such as shown at *b* in said figure. The typewritten sheet is photographed and the exposed film employed for etching a metal plate, usually of aluminum. The ink is then applied to the plate and offset on a rubber blanket from which impressions are made for the final printed copy.

For purposes of illustration, the invention is shown in combination with a power driven typewriting machine of well known type comprising a platen 1 with which types 2 cooperate to print from a ribbon 3 projected therebetween by a vibrator 4 in which the ribbon is carried. The types are mounted on a type bar 5 pivoted in a type basket 6, key controlled means being provided for swinging the type bar to engage the type with the platen. To this end, a toggle lever 7 is pivoted to the type bar intermediate its ends, and at one end to a toggle arm 8 pivoted on a fixed part of the frame of the machine. The other arm of the toggle lever is connected with power actuated devices by means of a link 9. Said devices comprise a bell crank lever 11 pivoted on a common pivot rod 12 and resiliently held in normal position with the type bar retracted by means of a spring 13 which connects the bell crank lever with a fixed part. The bell crank lever 11 is connected with a power unit comprising a bell crank lever 14 by means of a link 15.

The bell crank lever 14 is pivoted on the common pivot rod 16 and has an arm 17 which projects downwardly adjacent the surface of a power driven roller 18 revolvably mounted in the machine frame. Pivotaly mounted on the arm 17 is a cam 19 which is normally out of engagement with the roller 18 but movable into engagement therewith to be rotated thereby. A spring-pressed arm 21 mounted on the lever 14 engages a lug or projection 22 on the cam and tends to turn it into engagement with the roller, or a lug 23 thereon into engagement with a stop 24 on a detent lever 25 pivoted on the lever 14. The upper end of the lever 25 is offset and engaged by the slotted end of an arm 26 projecting from a key lever 27 pivoted on the common pivot rod 12. At its forward end, the key lever has a key 28 thereon whereby it may be manually operated. A spring 29 connects the key lever with a fixed part and resiliently retains it and the parts connected therewith in the normal position shown in Fig. 1. Although only one type bar and connected parts are shown in the drawings for the purpose of clearness of illustration, it will be understood that the usual or any required number are or may be employed.

The ribbon vibrator is slidably mounted on a type guide 31 projecting upwardly and rearwardly to a point adjacent the printing point on the platen from the type basket on which it is mounted. The ribbon vibrator has a downwardly projecting arm 32 pivotally connected with the free end of an arm 33 pivoted on the frame, means being provided for swinging said arm to move the vibrator to carry the ribbon to the printing point on the platen when the type bar is operated. To this end, a link 34 is pivoted at one end to the arm 33 and at its other end is connected to a laterally projecting stud 35 arranged in an open slot 36 in an actuator 37 pivoted on a fixed part. The actuator 37 is operatively connected with a universal bar 38 by means of a link 39 pivoted at one end to the actuator and at its other end to a rearwardly projecting arm 41 on the universal bar. The universal bar is pivoted on a fixed part of the frame and extends transversely thereof and projects into the paths of arms 42, one of which projects downwardly and rearwardly from each of the bell cranks 11. The arm 41 has a downwardly projecting arm 43 which is connected with a fixed part by means of a spring 44 which operates to swing the universal bar into resilient engagement with the arms 42 and the actuator 37 to retract the ribbon vibrator. A stop 45 is adjustably mounted on the frame and limits the movement of the universal bar against the tension of the spring. When one of the bell crank levers 11 is swung to move the type into engagement with the platen, it swings the actuator 37 through the universal bar to move the ribbon vibrator to interpose the ribbon between the type and the printing point on the platen.

The types 2 are or may be of usual construction, and in order to secure both bold and light faced typewritten impressions therefrom, such as *a* and *b* shown in Fig. 5, a two-tone ribbon, such as shown in detail in Fig. 4 or Fig. 6, is or may be employed. The ribbon shown in Fig. 4 is or may be of the usual or preferred width, and comprises two bands 46 and 47 extending throughout its length and corresponding respectively to the bold and light faced impressions *a* and *b*. This ribbon is constructed of fabric such as usually employed for this purpose, which is impreg-

nated with a suitable pigment preferably black, the band 47 being impregnated with a normal or usual quantity of the pigment, while the band 46 is more heavily impregnated, and impressions made therefrom are normally bolder and blacker in color than those made from the band 47 which appear lighter or by comparison gray in color, and the lines forming the characters are narrower than those formed from the band 46.

A slightly modified form of the ribbon is shown in Fig. 6, which comprises a band 46' of heavy fabric which corresponds to the band 46 and is heavily impregnated with pigment for making bold faced type impressions. Secured to or formed integral with the band 46' is a band 47' which corresponds to the band 47 for making light faced type impressions, and is or may be constructed and impregnated in a similar manner.

It is desirable to provide means for selecting the band or portion of the ribbon from which the type impressions are to be made. To this end, the stud 35 is manually adjustable in the slot 36 toward and from the pivotal axis of the actuator 37 for varying the throw of the arm 33 and hence the extent of movement imparted to the ribbon vibrator. In the position illustrated in Fig. 1 of the drawings, the stud is positioned in the slot 36 to move the ribbon vibrator an extent sufficient to carry the lower heavily impregnated band 46 of the ribbon to the printing point. The stud 35 is connected with an arm 48 secured to a rock shaft 49 by means of a link 51. The rock shaft 49 is mounted in the frame of the machine and has a second arm 52 secured thereto, the free end of which is pivotally connected with a push rod 53 slidably mounted in the frame of the machine and extending forwardly to a point adjacent the key board where it is provided with a fingerpiece or key 54 whereby it may be manually operated. Rearward movement of the push rod serves to rock the shaft 49 and move the stud 35 forwardly in its slot to a point nearer the axis of the actuator 37, in which position the actuator swings the arm 33 through a lesser arc and the ribbon vibrator is moved through a shorter path to move the band 47 of the ribbon to the printing point on the platen. A detent 55 is mounted on the frame and resiliently engages one or another of a pair of projections 56 and 57 on the push rod and serves to retain it in adjusted position.

Although there is a vast difference in the boldness of the type impressions produced as above described, much greater differences are to be obtained if the impressions from the band 46 of the ribbon are made with greater force than those from the band 47. To this end, means are provided for increasing the force of the type impressions when the ribbon vibrating devices are adjusted to print from the band 46 of the ribbon and for decreasing the force of such impressions when said devices are adjusted to print from the band 47 of the ribbon. Said devices are preferably controlled automatically by the ribbon shifting devices. In the illustrated embodiment, the power driven roller 18 is operated by an electric motor 61, see Fig. 2, the drive shaft 62 of which is operatively connected with the roller 18 by means of worm and gear devices 63. By increasing the speed of the roller 18, the speed of the cam 19 cooperating therewith is also increased and with it the speed of the type bar to increase the force of the blow imparted thereby to the platen. Referring to the diagram of the motor windings in Fig. 3 of the drawings, it will be noted that the motor

is of the compound wound type having the main circuit 64 and the shunt 65 comprising a variable resistance 66 which may be adjusted to obtain a normal speed for normal impressions of the type bar through the band 47 of the ribbon. By increasing the resistance in the shunt, the speed of the motor and also of the roller 18 is increased, and by decreasing this resistance, the speed of the motor and of the power driven roller 18 is decreased. For the purpose of increasing or decreasing this resistance, any portion thereof may be shunted by means of a shunt circuit 67 having a switch 68. By closing the switch 68, the resistance in the shunt circuit 65 is reduced and the speed of the motor is correspondingly decreased. When the ribbon vibrator is adjusted for writing from the heavily impregnated band 46 of the ribbon, as shown in Fig. 1, the switch 68 is open and the types strike the platen with heavy blows, due to the high speed at which the power roller 18 is driven. The terminals or contact members 69 and 70 of the switch 68 are insulated from each other and mounted on the frame of the machine. Also mounted on the frame of the machine adjacent the contact member 70 but insulated therefrom is a resilient arm 71 which is arranged in the path of the push rod 53 or a projection 72 thereon. When the push rod is pushed rearwardly from the position shown in Fig. 1 to shift the ribbon vibrator to write from the band 47 of the ribbon, it engages the spring finger 71 and operates it to close the switch 68, causing a reduction in the speed of the roller 18 and a corresponding reduction in the force of impact of the type on the platen. When the push rod is again operated to shift the ribbon to write from the denser band 46, the switch is opened due to the resiliency of the arms 70 and 71, thus increasing the resistance in the shunt 65, which results in increased speed of the motor and the power driven roller 18 to increase the force of impact of the types.

With the apparatus described herein, bold faced typewritten impressions are produced, such as shown at *a* in Fig. 5. At this time, the type impressions are made from the heavily inked band of the ribbon and the switch 68 is open or in the position in which the motor is driven at maximum speed to engage the types with the platen with maximum force. The written character thus produced is of the bold faced kind having broader lines of a deeper black color than characters produced from the band 47 of the ribbon, and with the power driven roller 18 operating at less speed to less forcibly engage the type bar with the platen, such characters have narrow lines having a relatively gray appearance.

The invention is capable of many changes and modifications, and this application is intended to cover the various changes or modifications which come within the spirit of the invention or scope of the following claims.

I claim:

1. In a typewriting machine for producing bold or light faced typewritten characters, the combination of a platen, type bars having types thereon movable into engagement with the platen, a ribbon vibrator movable to interpose a ribbon between the printing point on the platen and the types, a ribbon in said vibrator having two portions, one of which is more heavily impregnated with pigment than the other for making either bold or light faced typewritten impressions on a

work sheet, means for shifting the vibrator to control the portion of the ribbon to be impressed on the work sheet, and means automatically controlled by said vibrator shifting means for increasing the force of the type impression when writing from the heavily impregnated portion of the ribbon.

2. In a typewriting machine for producing bold or light faced typewritten characters, the combination of a platen, type bars having types thereon movable into engagement with the platen, a ribbon vibrator movable to interpose a ribbon between the printing point on the platen and the types, a ribbon in said vibrator having two portions, one of which is more heavily impregnated with pigment than the other for making either bold or light faced typewritten impressions on a work sheet, means for selectively controlling the portion of the ribbon to be impressed on the work sheet, power driven devices for actuating the type bars, and means controlled by said last mentioned means for increasing the speed of said power driven devices to increase the force of impact of the type impressions when writing from the heavily impregnated portion of the ribbon.

3. In a typewriting machine for producing either bold or light faced typewritten characters, the combination of a platen, type bars, types on said type bars, power driven devices for moving the type bars to engage the type with the platen, an electric motor for operating said power driven devices, a ribbon vibrator for interposing a ribbon between the types and printing point on the platen, a ribbon in said vibrator having two bands, one of which is more heavily impregnated with pigment than the other for making either bold or light faced impressions on a work sheet, manually operated means for controlling the movement of the vibrator for selecting the band of the ribbon from which the impressions are made, and means controlled by said manually operated means for increasing the speed of said motor when moved to make impressions from the heavily impregnated band of the ribbon to increase the force of impact of the types.

4. In a typewriting machine for producing either bold or light faced typewritten characters, the combination of a platen, type bars, types on said type bars, power driven devices for moving the type bars to engage the type with the platen, an electric motor for operating said power driven devices, a ribbon vibrator for interposing a ribbon between the types and printing point on the platen, a ribbon in said vibrator having two bands, one of which is more heavily impregnated with pigment than the other for making either bold or light faced impressions on a work sheet, manually operated means for controlling the movement of the vibrator for selecting the band of the ribbon from which type impressions are made, a switch for controlling the speed of said motor, and means controlled by said manually operated means for operating the switch to increase the speed of the motor when the manually operated means is moved to make impressions from the heavily impregnated band of the ribbon to increase the force of impact of the types.

5. In a typewriting machine for producing either bold or light faced typewritten characters, the combination of a platen, type bars, types on said type bars, power driven devices for moving the type bars to engage the type with the platen, an electric motor for operating said power

driven devices, a ribbon vibrator for interposing a ribbon between the types and printing point on the platen, a ribbon in said vibrator having two bands, one of which is more heavily impregnated with pigment than the other for making either bold or light faced impressions on a work sheet, a manually operated rod for controlling the movement of the vibrator for selecting the band of the ribbon from which type impressions are made, a switch for controlling the speed of said motor, and an arm on said rod for controlling the switch to increase the speed of the motor when the rod is operated to make impressions from the heavily impregnated band of the ribbon to increase the force of impact of the types.

6. In a typewriting machine for producing either bold or light faced typewritten characters, the combination of a platen, type bars, types on said type bars, a power driven roller, devices actuated by said power driven roller for moving the type bars to engage the type with the platen, a ribbon vibrator for interposing a ribbon between the types and the printing point on the platen, a ribbon in said vibrator having two bands, one of which is more heavily impregnated with pigment than the other for making either bold or light faced impressions on a work sheet, manually operated means for controlling the

movement of the vibrator for selecting the band of the ribbon from which type impressions are made, and means controlled by said manually operated means for increasing the speed of said power driven roller to increase the force of impact of the types when said means is operated to make bold faced impressions.

7. In a power driven typewriting machine, the combination with a power driven roller, printing instrumentalities, means for selectively connecting said printing instrumentalities with said roller to be driven thereby, ribbon shifting mechanism, hand operated means for actuating the ribbon shifting mechanism, and devices controlled by the ribbon shifting mechanism for automatically changing the speed of said motor.

8. In a power driven typewriting machine, the combination with a power driven roller, an electric motor for driving said roller, printing instrumentalities, means for selectively connecting said printing instrumentalities with said roller to be driven thereby, means for changing the speed of said motor comprising a switch, and ribbon shifting mechanism, manual means for operating the ribbon shifting mechanism, and devices controlled by the ribbon shifting mechanism for automatically operating said switch.

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