April 4, 1939. F. BECKER 2,152,858

TYPEWRITING MACHINE

Filed April 9, 1937 2 Sheets-Sheet 1

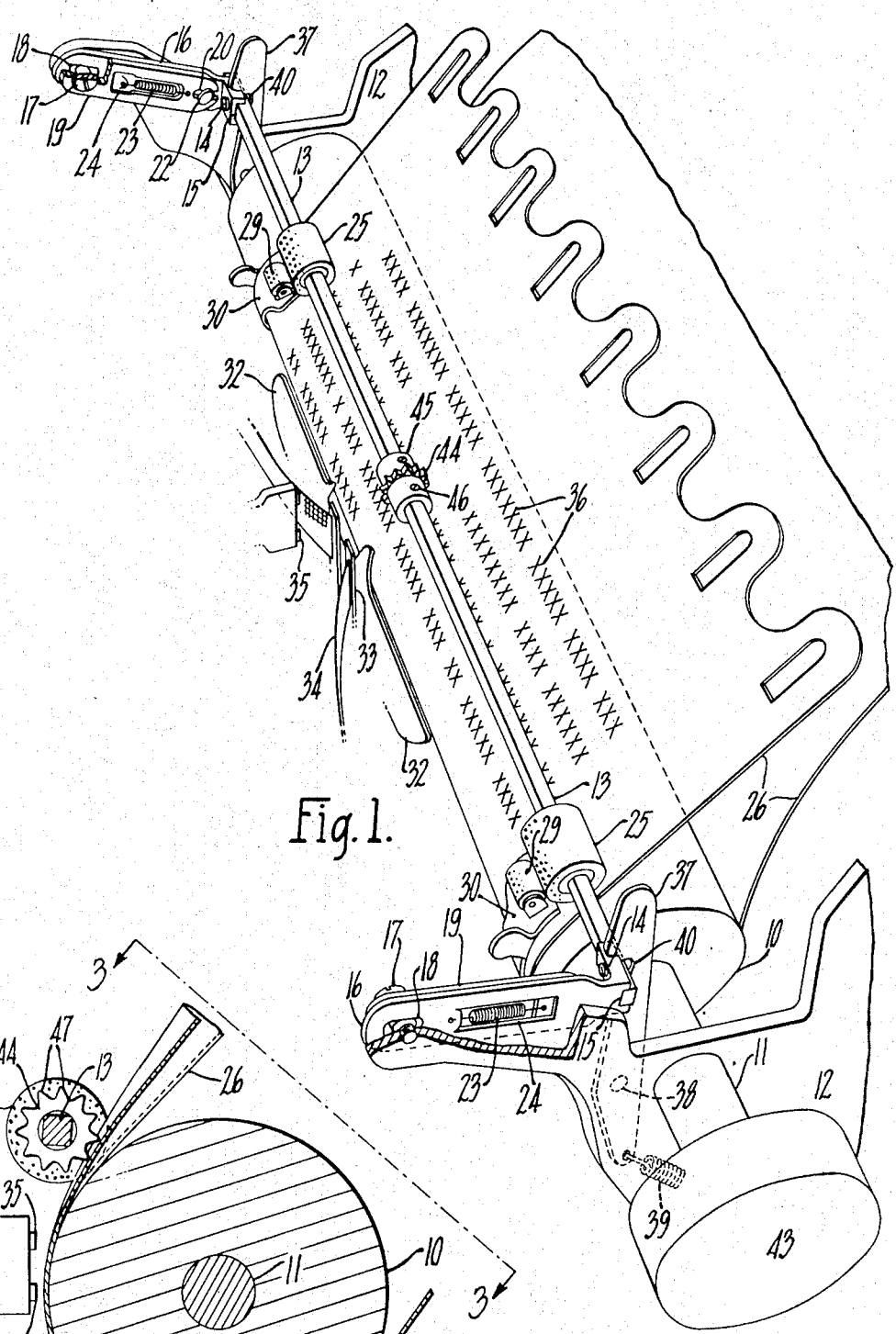


Fig. 1.

Fig. 2.

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TYPEWRITING MACHINE

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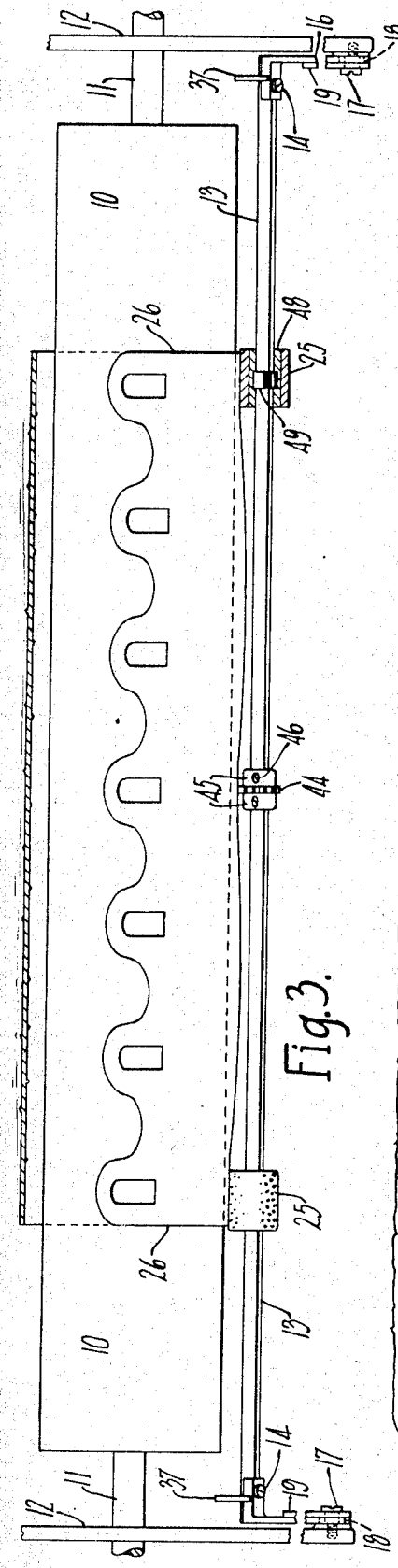


Fig. 3.

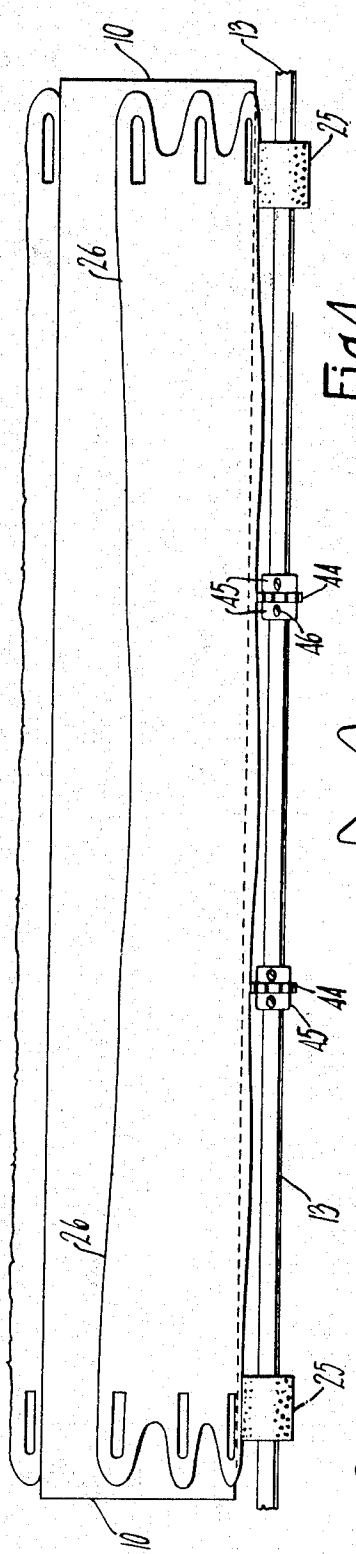


Fig. 4.

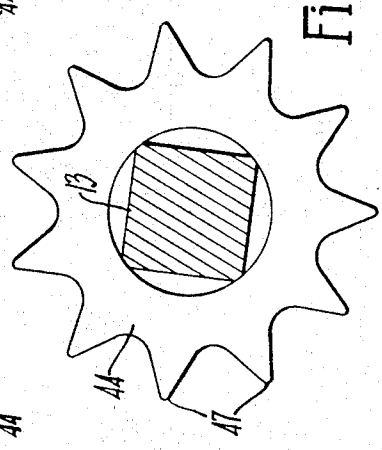


Fig. 5.

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UNITED STATES PATENT OFFICE

2,152,858

TYPEWRITING MACHINE

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Application April 9, 1937, Serial No. 135,909

3 Claims. (Cl. 197—138)

A "multilith" sheet, which is usually made of thin and flexible zinc or aluminum, or any suitable lithograph material, is placed in the typewriter, and is fed around the platen and past the printing point by the usual bottom feed rolls. Auxiliary margin rolls at the delivery side of the platen hold the metal sheet against the platen at the line of printing. The auxiliary rolls are suitable to run only on the margin of the metal multilith sheet, because they must not run upon the inked letters that are typed upon the sheet.

The sheet tends to straighten and therefore bellies out from the platen between the marginal auxiliary rolls. This happens because said pressure rolls hold the sheet only by its side margins. The sheet bellies forwardly from the points where its side margins are gripped by the rolls. An attempt to position an auxiliary roll at the middle of the platen to run upon the middle portion of the sheet to prevent bulging, will result in a pick up of some ink from the typed characters that are rolled past this middle auxiliary roll. Eventually enough ink may be picked up in this way, so that a smudge will appear upon the metal sheet, this smudge being produced by the rollers after they have become inked. A smooth auxiliary roll, placed to guide the middle of the sheet, would also tend to slip upon the "multilith" sheet and would tend to scratch its coating that is repellent to reproducing ink.

The trouble referred to is greater when the metal sheet is placed in the machine with its longer side running parallel with the platen. The present invention employs one or more specially designed non-smudging guides to lightly guide the central portion of the sheet. These guides are in the form of peripherally toothed wheels. One or more of these pointed wheels may be positioned at or near the middle of the platen. They may be upon a rod which may also support the aforementioned marginal rolls. The diameter of the toothed wheel or wheels is less than the diameter of the marginal rolls that hold the sides of the sheet snugly to the platen. These marginal and middle rolls are some distance above the printing line, and are able to hold the sheet back well enough to cause it to back solidly against the platen at the printing line, even though it begins to separate from the platen above the printing line and below the rolls. The toothed roll is not a work-sheet feeder. It does not drive the sheet. It is loose and turnable on the rod. The teeth may be perhaps $\frac{1}{16}$ of an inch wide, and their points may be slightly dulled without detracting from their ability to hold the bulging sheet back near to the platen. The sheet tends to straighten out, however, and springs out from the platen and presses slightly against the points of the guide-wheel, so that the wheel is driven by the contacting sheet to turn upon its rod. The spring of the sheet is weak where it contacts the toothed guide-wheel, and hence there is little pressure upon the pointed wheel so that it cannot take up ink freely from the type impressions on the sheet. The sheet is rolled safely and efficiently through the machine, but the teeth will have no perceptible effect of inking or blurring the sheet.

The middle guide roll may have a plurality of teeth which have curved or smooth transverse sheet-contacting edges of a width preferably less than a single letter-space and being spaced from each other and from the platen so that the guide wheel turns as the work-sheet feeds whereby the wheel turns without slipping relatively to the sheets. The rounding of the edges of the teeth and their spacing from the platen are adapted to obtain very light traction on the bulging metal sheet so that the toothed wheel travels concurrently with the multilith sheet as the latter is fed, and no indentations are left in the multilith sheet, nor does the toothed wheel pick up ink from the work-sheet, nor is the light coating of the multilith sheet mutilated or scratched.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a perspective view showing a master multilith sheet in printing position.

Figure 2 is a cross-section taken on Figure 1 at the right of the printing point, but enlarged.

Figure 3 is a plan view along the line 3—3 of Figure 2.

Figure 4 is a plan view similar to Figure 3 showing the master multilith sheet fed edgewise in the typewriter, and two of the improved feed rolls.

Figure 5 is an enlarged side view of the improved feed roll.

The usual cylindrical typewriter platen 10 has axles 11 mounted in the ends 12 of a platen-carriage which may be one of the standard lengths. A bail 13 is detachably mounted by screws 14 in grooves 15 formed in the ends of arms 16 which are pivoted on screws 17 by means of horizontal slots 18 which permit the bail 13 to move forwards away from the platen 10. Arms 19 have horizontal slots 20 at their rear ends through which pass screws 22 which are mounted in the arms 16. Coil springs 23 are mounted in coincident central slots 24 in arms 16 and 19, respectively, at opposite ends and therefore the bail 13 is

spring-pressed toward the platen 10 at each end. Guide rolls 25 are slidably and rotatably mounted on the bail 13, one on each end, and are the usual soft rubber cylinders. A Duplex master aluminum multilith sheet 26 is guided under the platen 10 by the customary feed rolls 27, 28, and 29, the latter being mounted in the usual metal guides 30. Scale plates 32 are spaced from the platen 10 a bit more than usual and so likewise the ribbon guide 33 which vibrates in front of the printing point a special Duplex paper carbon printing ribbon 34 through which type 35 impress characters 36 on the master multilith sheet 26. Arms 37 are pivoted on pins 38 mounted on the inner walls of sides 12 of the platen-carriage. Springs 39 tied to the arms 37 below the pins 38 tend to hold notches 40, formed in the front walls of arms 37, over the bail 13, and so lock the guide rolls 25 firmly down over the edges of the master multilith sheet 26. The printing side of the sheet 26 may be covered with an ink-repelling coating 42; the sheet 26 may be coated on both sides. Care must be taken to keep the guide rolls 25 off the printed characters 36 because the special Duplex paper carbon ribbon 34 is impregnated with a special soft smudgy carbon printing ink which would track and smear under the soft rubber rolls 25.

After the top of the metal master multilith sheet 26 is line-spaced by a platen-knob 43 or by the usual line-space lever (not shown) in an Underwood Standard Noiseless typewriter up past the printing point, the center of the sheet 26, due to its inherent properties, tends to bulge away from the platen 10 as shown in Figures 2 and 3. This bulge tends to engage the bail 13 and to cause scratches on the plate 26, mutilating the special ink-repelling coating 42, and so causing spots or blotches on the printed reproductions. This bulge also tends to move the plate 26 at the center away from the platen 10 to leave a space therebetween so that type 35 fail to meet a firm printing surface, a condition fatal to clear and proper impressions on the sheet 26, because the type 35 must emboss the sheet slightly and precisely under definitely set pressure of the type 35. To overcome the above-recited defects a special centrally apertured guide roll 44, one or more, is rotatably mounted on the bail 13 to engage the printed characters 36, and is held against motion along the bail 13 by a pair of collars 45, each fastened on the bail 13 by a screw 46. The roll 44 may be made of metal, preferably steel, having a minimum or negligible traction of adhesion for the special Duplex carbon ink, and may have radially disposed a plurality of "points", 47, eleven as shown in Figure 5, equidistant from one another and having smooth rounded contacting surfaces, which cause the roll 44 to turn concurrently with the sheet 26 as the latter is fed, but which tend to roll and press down the special carbon ink, but not to pick it up. The circumferential distance between the centers of adjacent "points" 47 may be different from the distance between the centers of adjacent lines of type-characters 36. The "points" 47 may extend parallel with the platen one-sixteenth of an inch or more, that is, the star-rolls 44 may be made of one-sixteenth inch stock. In one form the diameter of the roll 44 may be one thirty-second of an inch less than the diameter of the feed rolls 25 It will be obvious that in other forms of the invention this difference in diameter may be more, as, for example, in Figure 2. It is also obvious from said Figure 2, that the toothed guide wheel 44 exerts a leverage upon the sheet 26 to bend it to conform with the curvature of the platen at the printing point and that said wheel 44 reacts with less pressure upon the work-sheet than the marginal guide roll.

As shown in Figure 4 the master multilith sheet 26 may be fed edgewise over the platen 10 in a wide-carriage machine so that the lines of printing will run up and down. On such carriages two special guide rolls 44 may be used intermediate of the marginal guide rolls 25. See Figure 4.

Referring to Figure 3 one of the rolls 25 is sectioned to show an interior sleeve 48 centrally grooved to hold a resilient metal collar 49 normally squeezing the rod 13.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriter, the combination with a platen, of means to guide a flexible work-sheet past a printing point to be typed thereupon, including, sheet-deflecting means adapted to bear upon marginal portions of the work-sheet at the delivery side of the platen, and a deflector in the form of a peripherally toothed wheel intermediate the marginal sheet-deflecting means, and cooperative with the marginal sheet-deflecting means to hold said flexible sheet against the platen at the printing line, said marginal and intermediate deflectors being so arranged relatively to each other and the platen, that the said intermediate toothed deflector-wheel reacts with less pressure upon the sheet than the marginal sheet-deflecting means.

2. In a typewriter having a revoluble platen and types movable to a printing point thereagainst, means for guiding a work-sheet at the delivery side of the plate and for holding said sheet against the platen at the printing line, said means comprising a rod movable into and out of operative position, rollers on said rod for urging the work-sheet margins against the platen beyond the printing line, and a toothed wheel on said rod intermediate said rollers and of less diameter than said rollers to contact by its teeth the infermediate portion of the work-sheet and cause it to bear against the platen at the printing line without pressing against the platen at the point of tooth contact.

3. In a typewriter having a revoluble platen and types movable to a printing point thereagainst, means for guiding a work-sheet at the delivery side of the platen and for holding said sheet against the platen at the printing line, a rod extending lengthwise of said platen, sheet-deflecting means supported on said rod and adapted to urge the work-sheet margins against the platen beyond the printing line, and a toothed wheel on said rod intermediate said marginal sheet-deflecting means to contact by its teeth the intermediate portion of the work-sheet, said toothed wheel being of such a diameter as to react with less pressure upon the sheet than the marginal sheet-deflecting means.

FRED BECKER.

CERTIFICATE OF CORRECTION.

Patent No. 2,152,858. April 4, 1939.

FRED BECKER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 43, claim 2, for the word "plate" read platen; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of May, A. D. 1939.

(Seal)

Henry Van Arsdale
Acting Commissioner of Patents.