May 25, 1937. H. FRINGS 2,081,701

TICKET PRINTER

Filed July 17, 1935

Fig. 1

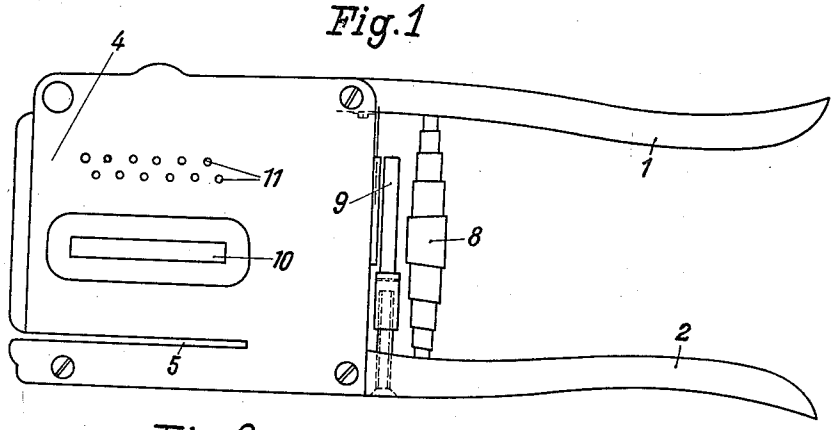


Fig. 2

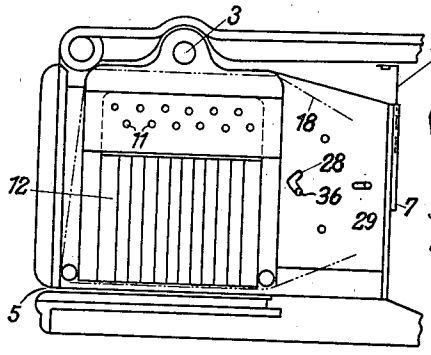


Fig. 3

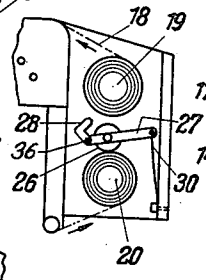


Fig. 4

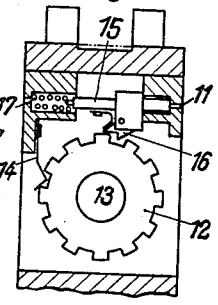
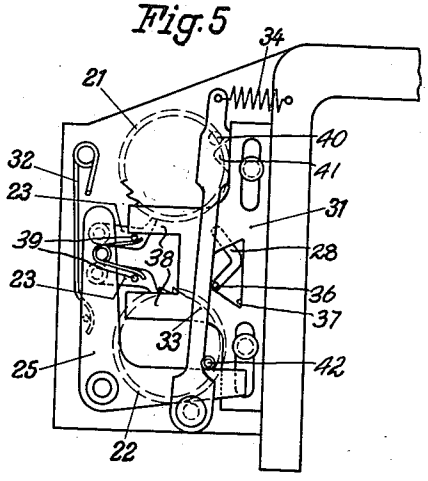


Fig. 5



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TICKET PRINTER

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In Germany July 20, 1934

6 Claims. (Cl. 101—96)

This invention relates to a forceps-like portable ticket printer.

In the known devices of this class the printing mechanism comprises adjustable type wheels and an inking ribbon capable of being moved by means of external rotary buttons while being unwound from one spool and wound upon another. Such manual feeding of the ribbon is, however, open to serious objections, as regular operation depends on the care and attention of the guard or conductor handling the machine.

The invention avoids these drawbacks by providing for automatic motion of the ribbon after each printing operation. Automatic feeding devices of this kind are known in typewriters, in which the ribbon is fed by actuation of the keys.

These devices employed in typewriters are, however, unsuited for forceps-like portable ticket printers in view of the entirely different conditions prevailing therein. In connection with such printers space plays a far more important part than in typewriters, and it is further necessary to arrange the printing and ribbon feeding mechanism in a closed casing if possible to protect the sensitive parts thereof against the entrance of dust. Protective measures of this kind can be left out of consideration in case of typewriters, and the difficulties involved in their provision explain why an automatic ribbon feed for forceps-like portable ticket printers is not known and has even not been proposed as yet. The known types of such printers are not adapted to receive automatic ribbon feeding devices, chiefly for the reason that each spool is arranged in a separate casing.

Unlike the known art, the invention arranges both ribbon spools in a common casing near the printing frame and provides them with automatic feeding and reversing means, feeding being effected after each printing operation during return of the handles into inoperative position and not during compression of the handles to prevent slurring. When one spool is empty, the ribbon motion is automatically reversed in accordance with the increase in diameter of the other spool. The spools are preferably disposed with the feeding means on a plate secured to the frame, so that the spools and the ribbon cooperate in the motion of the frame and no additional tension appears in the ribbon during printing. The ribbon is fed by means of a bell crank articulated to the plate secured to the frame and carrying on its free arm pawls engaging toothed wheels coaxially connected with the spools, the other free arm of the crank, during return of the frame, striking against a stop disposed on the casing. The entire printing unit is positioned in a casing that is absolutely dust-tight except for a ticket slot to prevent soiling of the printing and sensitive feeding mechanisms. Packing of the movable handle in the head casing of the device is effected by guiding a plate arranged on this handle in a pocket of the back of the casing. The type wheels can be adjusted from the outside so as to prevent dust from entering the inside during the adjusting operation by means of holes in the back of the casing, against which a pin is tightly pushed from the inside under spring pressure, the number of holes corresponding to the number of type wheels. In the adjusting hole a socket wrench is inserted, whereby the spring-actuated pin is pressed back to rotate the respective type wheel by means of a nose.

By way of example, one form of the invention is illustrated in the accompanying drawing, in which Figure 1 is a side view of a forceps-like portable ticket printer with the casing closed; Fig. 2, a side view of the head portion of the printer with the cover of the casing removed; Fig. 3, a detail view of the right-hand portion of Fig. 2 with the plate covering the ribbon mechanism removed; Fig. 4, a cross section of the portion of the printer containing the type wheels; and Fig. 5, a detail view on an enlarged scale of the ribbon mechanism and corresponds to the back of Fig. 3.

Referring to the drawing, 1 is the upper handle and 2 the lower handle. The frame with the entire printing mechanism is articulated to the upper handle 1 by means of the pin 3. The printing mechanism is surrounded by a casing 4 which is perfectly closed except for the ticket slot 5. To insure tight sealing on the back, the motion of the handles 1 and 2 towards one another notwithstanding, a plate 6 secured to the upper handle 1 is guided in a pocket 7 on the back of the casing 4. Between the handles 1 and 2 a compression spring 8 is arranged in the usual way, and one of the handles is provided with a stop pin 9 for limiting the stroke and thus adjusting impression, the height of the pin 9 being accurately adjustable like a micrometer screw. The wall of the casing visible in Fig. 1 has a window 10 covered with transparent fabric for reading the adjusted printing matter, and above the window 10 a plurality of apertures 11 are provided by means of which the type wheels can be adjusted. The type wheels 12 are disposed side by side on a shaft 13, each type being doubly arranged in known manner to have the same type appear in the stamp and also in the window 10 of the casing 4.

Each type wheel 12 is individually locked by a spring 14, as shown in Fig. 4, and for rotating each wheel one step a pin 15 having a nose 16 which engages the wheel and is longitudinally displaceable is provided above each wheel. Each pin 15 fits into one of the adjusting apertures 11 and, when in a position of rest, is pressed by the spring 17 against its respective aperture 11 so as to close it tightly. If an adjusting pin is introduced through the aperture 11 within the limits set by a stop, the pin 15 will be pressed back against the action of the spring 17 and the nose 16 will turn the type wheel another step. As the adjusting pin fits accurately into the aperture 11, perfect tightness is maintained also during adjustments, and a guard or conductor handling the printer can adjust the printing in this simple manner at will when starting on his trip without interfering with the dust-tight enclosure of the printing mechanism.

The ribbon 18 is indicated in Fig. 2 by dots and dashes, and the mechanism moving the same is shown in Figs. 3 and 5. The ribbon 18 unwinds from a roll 19 and is wound upon a roll 20, or vice versa. The rolls 19 and 20 are disposed on lateral plates 29 secured to the frame, and are coaxially connected, respectively, with the toothed wheels 21 and 22 engaged by the elastic pawls 23 attached to the free end of the bell crank 25 rotatably disposed on one of the plates 29. When the handle 1 is released and the printing mechanism 12 starts its return motion, the bell crank 25 is turned against the resistance of the spring 32 so that the pawl 23 engages the teeth in the wheel 22. In view of the stop 42 mounted on the casing 4, which limits the rocking movement of the bell crank 25, continued return movement of the printing mechanism 12 will cause the pawl 23 to turn the toothed wheel 22 whereby the ribbon will be moved stepwise in one direction. It will be noted that when the pivoted handle 1 is depressed, the spring 32 will cause the bell crank 25 to move outward and disengage the pawl 23 from the toothed wheel 22.

When the ribbon 18 has been fully wound upon a roll, the motion thereof is automatically reversed by the mechanism shown in Fig. 3. In the position shown, the ribbon is wound upon the lower roll 20 on which rests a small roller 26 movably arranged in the lever 27. The movable end of the lever 27 carries a pin 36 which is guided in an angular slot 28 formed in the side plates 29. As soon as the roller 20 is wound to such extent that the pin 36 of the lever 27 is moved beyond the middle of the angular slot 28, the lever 27 is moved upward by the spring 30, so that the roller 26 contacts the upper ribbon roll. In the course of this movement, the reversing slide 31 (Fig. 5) is moved upward. The slide 31 has a cut-out portion 37 through which the pin 36 of the lever 27 is projected, and is provided with two pawls 38 which surround the pins 39 situated upon the elastic pawls 23. When the slide 31 is moved upward by the pin 36 it presses the lower elastic pawl 23 upward so that the lower pawl is moved out of engagement with the toothed wheel 22, and it frees the upper elastic pawl which is brought by a spring into engagement with the toothed wheel 21. This will reverse the direction of movement of the ribbon. The spring 32 continues to press the lever 25 into its extreme left-hand position. The lever 33 with its pin 40 is firmly pressed by the spring 34 against the triangular inclined surface 41 of the slide 31. By this arrangement, the slide 31 is maintained in its extreme position until it is moved into an opposite position by the described means.

I claim:—

1. A forceps-like portable ticket printer, comprising a ticket printing mechanism, a dust-proof casing enclosing said ticket printing mechanism and having a slot for the insertion of a ticket, a handle pivoted in said casing and adapted to be actuated by an operator, means operatively connecting said handle with said ticket printing mechanism to actuate the latter when said handle is actuated, a plate carried by said handle and movable therewith, and means forming a pocket carried by said casing for guiding said plate while said handle is actuated.

2. A forceps-like portable ticket printer, comprising a plurality of type wheels, a dust-proof casing enclosing said type wheels and having a slot for the insertion of a ticket, means rotatably supporting said type wheels within said casing, a separate pin for each type wheel, one end of each pin being situated in a separate aperture formed in said casing, separate resilient means pressing said end of each pin against the walls of said aperture, and a separate nose carried by each pin and adapted to engage a separate type wheel to turn the same when said pin is moved in a direction toward its resilient means to compress the same, a handle pivoted in said casing and adapted to be actuated by an operator, and means operatively connecting said handle with said type wheels to actuate the latter when said handle is actuated.

3. A portable ticket printer comprising a stationary frame and a handle and a second frame reciprocably mounted on said stationary frame, a second handle pivoted to said stationary frame engaging said movable frame and adapted to be pressed towards said first mentioned handle, a printing mechanism mounted on said movable frame, two ribbon rolls each having a toothed wheel, one above the other mounted on said movable frame and having a printing ribbon adapted to travel beneath said printing mechanism, a bell crank rotatably mounted on said movable frame, a pair of pawls carried by one arm of said bell crank and extending between said ribbon rolls, said pawls being adapted to alternately engage said toothed wheels, resilient means carried by said movable frame engaging said bell crank for disengaging said pawls from said toothed wheels when said pivoted handle is pressed against said stationary handle and means carried by said stationary frame for limiting the return movement of the other arm of said bell crank whereby said toothed wheels will be rotated in one direction when said movable frame is returned to its original position.

4. A portable ticket printer comprising a stationary frame and a handle and a second frame reciprocably mounted on said stationary frame, a second handle pivoted to said stationary frame engaging said movable frame and adapted to be pressed towards said first mentioned handle, a printing mechanism mounted on said movable frame, two ribbon rolls each having a toothed wheel, one above the other mounted on said movable frame and having a printing ribbon adapted to travel beneath said printing mechanism, a bell crank rotatably mounted on said movable frame, a pair of pawls carried by one arm of said bell crank and extending between said ribbon rolls,

said pawls being adapted to alternately engage said toothed wheels, resilient means carried by said movable frame engaging said bell crank for disengaging said pawls from said toothed wheels when said pivoted handle is pressed against said stationary handle and means carried by said stationary frame for limiting the return movement of the other arm of said bell crank whereby said toothed wheels will be rotated in one direction when said frame is returned to its original position and means for automatically reversing the movement of said ribbon rolls and of the ribbon after the entire length of the ribbon has been employed.

5. A portable ticket printer comprising a stationary frame and a handle and a second frame reciprocably mounted on said stationary frame, a second handle pivoted to said stationary frame engaging said movable frame and adapted to be pressed towards said first mentioned handle, a printing mechanism mounted on said movable frame, two ribbon rolls each having a toothed wheel, one above the other mounted on said movable frame and having a printing ribbon adapted to travel beneath said printing mechanism, a bell crank rotatably mounted on said movable frame, a pair of pawls carried by one arm of said bell crank and extending between said ribbon rolls, said pawls being adapted to alternately engage said toothed wheels, resilient means carried by said movable frame engaging said bell crank for disengaging said pawls from said toothed wheels when said pivoted handle is pressed against said stationary handle and means carried by said stationary frame for limiting the return movement of the other arm of said bell crank whereby said toothed wheels will be rotated in one direction when said frame is returned to its original position and means for automatically reversing the movement of said ribbon rolls and of the ribbon after the entire length of the ribbon has been employed, said last mentioned means comprising an angular slot on said movable frame, a lever having one end mounted in said angular slot and resiliently resting on one of said ribbon rolls and a slide operatively connected with said lever whereby the pawl previously in engagement with one of said toothed wheels is disengaged and the other pawl put into engagement with the other toothed wheel.

6. A ticket printer according to claim 5 in which said slide is provided with means for securing the same in its respective positions for actuation of the respective toothed wheels.

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