A portable imprinting device for transferring indicia from an embossed printing plate to a paper form, the device having a roller carriage assembly that includes means for adjusting the position of the imprinting roller relative to the paper form in order to effect a proper imprinting action on the paper form.

7 Claims, 4 Drawing Figures
ROLLER ADJUSTMENT FOR IMPRINTING DEVICE

BACKGROUND OF THE INVENTION

The present invention has particular application for transferring information from an embossed plate, such as a credit card, to a paper form after dispensing of services or the sale of merchandise or the like, and is an improvement in the invention disclosed in U.S. Pat. No. 3,572,241 dated Mar. 23, 1971 and entitled Imprinting Device.

Although the imprinting device as disclosed in the aforesaid co-pending application has performed satisfactorily for the purpose intended, the position of the imprinting roller relative to the paper form as located on the base of the device had to be precisely determined in order to obtain the necessary pressure of the roller on the paper form during the imprinting operation. In the assembly of the device, this was difficult to determine since the roller was mounted in position prior to testing of the device in use and adjustments could only be made by disassembling the unit and resetting the roller. After the user obtained the device, if the thickness of paper forms or the credit card varied from the normal specifications, an adjustment would be required of the roller assembly in order to obtain the proper results in the imprinting operation. Such an adjustment again required that the component parts of the roller be disassembled and relocated which was not only difficult to effect but further required that the device be returned to the manufacturer or to a special service establishment.

SUMMARY OF THE INVENTION

The present invention incorporates an adjustment for the imprinting roller of the type embodied in co pending application Ser. No. 859,770 and includes a convenient adjustment assembly that enables the imprinting roller to be adjusted relative to a paper form so that a proper imprinting action can be obtained on the paper form. The adjustment assembly includes an eccentric cam that is mounted on the shaft of the roller carriage assembly in eccentric relation thereto. The eccentric cam carries the imprinting roller thereon so that the roller is also located in eccentric relation with respect to the shaft of the roller carriage. An adjustment wheel joined to the eccentric cam is rotatable to shift the axis of the roller relative to the paper form thereby locating the roller in that position that will provide the required pressure on the paper form. The adjustable roller not only enables the proper position of the roller carriage assembly to be determined during the initial assembly of the imprinting device, but enables subsequent adjustments to be accomplished without complete disassembly of the device.

Accordingly, it is an object of the present invention to provide a portable imprinting device for transferring information from an embossed printing plate to a printed form that includes an adjusting means that enables the embossing roller to be properly located relative to the paper form.

Another object of the invention is to provide a portable imprinting device that includes a roller assembly having an adjustable cam that enables the embossing roller of the device to be located in proper position with respect to the paper form that is inserted in the device during the operation thereof.

Still another object is to provide an adjustable roller for use in a portable imprinting device that is adjustable relative to a paper form by rotation of a cam that is mounted eccentrically with respect to the shaft of the roller, the cam being fixed in position by a locking construction that is easily accessible whenever further adjustment of the roller with respect to the paper form is required.

Other objects, features and advantages of the invention shall become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawings.

DESCRIPTION OF THE DRAWINGS

In the drawings which illustrates the best mode presently contemplated for carrying out the present invention:

FIG. 1 is a side elevational view with parts broken away and shown in section of the imprinting device embodied in the present invention;

FIG. 2 is a bottom plan view of the cover of the imprinting device with parts shown in section, the cover being pivotally connected to the base that is illustrated in end elevation;

FIG. 3 is a bottom perspective view of the imprinting device embodied herein, showing the opening in the cover that provides access to the adjustment wheel of the roller adjustment assembly; and

FIG. 4 is an exploded perspective view of the roller adjustment assembly.

DESCRIPTION OF THE INVENTION

Referring now to the drawings, the imprinting device embodied in the present invention is illustrated and is generally indicated at 10. The imprinting device 10 is illustrated and described in detail in co pending application, Ser. No. 859,770, and as set forth in said application, the imprinting device 10 is designed principally for use with a plate of the type that is generally associated with credit cards which include embossed printing thereon that provides for the transfer of the information on the printing plate to a paper form having carbon sheets interposed between paper sheets.

Referring again to the drawings and particularly to FIGS. 1 and 2, the imprinting device 10 includes a base generally indicated at 12 to which a cover, generally indicated at 14, is pivotally connected. As illustrated In FIG. 1, the base 12 is defined by a bottom wall 16 to which opposed upwardly extending side walls 17 and 18 are joined. A rear wall 19 is formed integral with the bottom wall 16 and side walls 17 and 18 and extending upwardly from the side walls 17 and 18 adjacent to the rear wall 19 are ear portions 20 and 21 which receive pivot pins 22, the pins 22 interconnecting the cover 14 to the base 12 in pivotal relation.

Although not illustrated, a recess is formed in the bottom wall 16 of the base adjacent to the side wall 17 thereof for accommodating a printing plate or credit card that is insertable through a slot 23 (FIG. 1) formed in the side wall 17. Additional locating means such as positioning ribs 24 are preferably formed as part of the bottom wall 16 and provide for locating a paper form indicated at 25 in FIG. 1 in proper position on the base 12. A suitable leaf spring 26 may also be secured to the bottom wall 16 for fixing the identifying plate in position adjacent to the slot 23 prior to the in-
sestion of the paper form 25 over the credit card as located on the bottom wall 16 of the base 12.

The cover 14 which contains the operating mechanism of the device includes a top wall 26 to which side walls 27 and 28 are joined. A front wall 29 and a rear wall 30 are joined to the top and side walls of the cover 14, the side walls 27, 28 of the cover 14 receiving the pins 22 therein and cooperating with the ears 20 and 21 of the base 12 for pivotally connecting the cover to the base 12. The top wall 26 also includes a pair of longitudinally extending ribs 32 that defines strengthening members for the top wall 26. An intermediate wall 33 is spaced from the side wall 28 in parallel relation, internal tracks 34 and 35 being formed in the walls 27 and 33 for receiving pairs of rolls of a roller assembly that is formed as part of a carriage assembly, generally indicated at 36. Overlying the tracks 34 and 35 are gibbs 37 and 38 that are secured to the side wall 27 and intermediate wall 33, the gibbs 37 and 38 acting to capture the guide rolls of the roller assembly in the tracks 34 and 35 so that the carriage assembly is easily movable in a longitudinal direction in the operation of the device.

Referring to FIG. 2, the carriage assembly 36 is illustrated in detail and as shown is mounted for longitudinal movement within the cover 14. The carriage assembly 36 includes a frame having an H configuration defined by side members 40 and 42 to which a cross member 44 is joined. A printing roller assembly generally indicated at 46 is mounted for rotation between the side members 40 and 42 and as will be described includes a roller 47 that is mounted in eccentric relation on a rear axle or shaft 48 that extends through the rear portion of the side members 40 and 42 and receives bearing rolls 50 and 52 on the outer ends thereof. A forward axle 54 extends through the front portion of the side members 40 and 42 and receives guide rolls 55 and 56 on the outer ends thereof, the guide rolls 55 and 56 being movable within the tracks 34 and 35 as formed in the side wall 27 and intermediate wall 33. As further shown in FIG. 4, the roller 47 is formed with a bore 47a that receives a cam member 57 having an offset bore 58 formed therein through which the shaft 48 extends. Thus the axis of the roller 47 is offset with respect to the axis of the shaft 48. As will be described hereinafter a wheel 59 formed on one end of the cam 57 is operable to adjust the position of the roller 47 relative to the base 16 to properly position the roller 47 for producing an effective printing on the paper form 25.

As further shown in FIG. 2, the bearing rolls 50 and 52 have needle bearings contained therein that provide for rotation of these rolls on the shaft 48 so that there is relatively uninhibited movement of the carriage assembly 36 in the imprinting operation. In this connection the guide rolls 55 and 56 only serve a guiding function for the carriage assembly and therefore are normally formed of a nylon material. The bearing rolls 50 and 52, thus not only provide for free movement of the carriage assembly but further positively locate the shaft 48 on which the roller assembly 46 is mounted. As described above, the gibbs 37 and 38 which overlie the tracks 34 and 35 enclose the rolls 50, 52 and rolls 55, 56 to provide for guided movement of the carriage assembly 36, within the tracks 34 and 35.

In order to locate the cover 14 in a latched position on the base 12 during the imprinting operation, a latch generally indicated at 60 is provided and, as shown in FIGS. 1 and 3, the latch 60 is defined by a plate 61 to which rearwardly extending ears 62 are joined, the ears 62 being connected to projections formed on the walls 27 and 28 by pins 64, thereby pivotally mounting the latch 60 on the cover 14. The latch 60 further includes latch portions 66 that are formed on the ends of the plate 61 and extend rearwardly with respect thereto, the latch portions 66 being engageable with latch pins 68 that project outwardly from the side walls 20 and 21 of the base 12. It is seen that as the cover is moved into overlying position on the base 12, the latch portions 66 engage the latch pins 68 to lock the cover on the base. In order to positively retain the latch 60 in the latching position as illustrated in FIG. 1, a latch spring 70 is provided, one end of the spring 70 being connectable to the latch 60 at 72 and the other end of the spring 70 being connectable to the cover at 74. As further illustrated in FIG. 1, the plate 61 of the latch 60 is formed with openings 76 that provide for entry of the arms of a handle generally indicated at 78. The plate 61 is also cut out to accommodate the paper form 25 therethrough.

As previously indicated, the carriage assembly 36 is movable in a longitudinal direction within the cover 14 during an imprinting operation, and in order to effect this movement, the handle 78 is provided. The handle 78 includes elongated arms 80 and 82 that are secured to the side members 40 and 42 respectively of the carriage assembly 36, the arms 80 and 82 projecting through the opening 76 in the latch plate 61 and terminating in reduced portions 84 and 86. A handlebar 88 is joined to the outermost ends of the arms 80 and 82 by fasteners 90 and 92 that project through spaced fingers 94 and 96. It is seen then that the carriage assembly 36 and the roller assembly 46 mounted thereon may be moved longitudinally during an imprinting operation by pulling on the handle 78, thereby causing the carriage assembly 36 to move therewith together with the printing roller 47. As further seen in FIG. 2, a knock-off member 98 extends outwardly from the cross member 44 of the carriage assembly 36 and is positioned so as to engage the latch plate 61 after the roller 47 has completed the imprinting operation. Thus, movement of the carriage assembly 36 toward the latch plate 61 during the imprinting operation causes the knock-off member 98 to engage the latch plate 61, thereby releasing the cover 14 from the latched position thereof after completion of the imprinting operation. As further seen in FIG. 2, one end of a spring 100 is connectable to a screw fastener 102 secured to the top wall 26 of the cover 14 and the other end of the spring 100 is secured to the carriage assembly at 104 to cause the carriage 38 to be moved in biased relation during the imprinting operation. Upon release of the handle 78 after the imprinting operation, the carriage 38 will automatically retract to the inactive position, as seen in FIG. 1.

During the imprinting operation, it is necessary that the paper form 25 be held firmly as the printing roller 47 is traversed thereacross. In order to positively locate the paper form 25 in the imprinting position and to further insure that the paper form is properly oriented
on the base 12, a clamp generally indicated at 106 is provided, and, as shown in FIG. 1, the clamp 106 includes an arm 108 to which a clamping portion 110 is integrally joined. The clamp 106 is mounted for pivotal movement on the end wall 30 of the cover 14 and, for this purpose, the end wall 30 is cut out intermediate the ends thereof to form flanges 112 as indicated in FIG. 2. A pin 114 extends through the flanges 112 and through the pivot axis of the clamp 106 to pivotally mount the clamp within the space in the end wall 30 as formed by the flanges 112. As the cover 14 is moved to a closed position, the arm 108 is moved into engagement with a leaf spring 116 that is fixed to the inner surface of the end wall 19 of the base 12. Thus as the cover 14 closes, the arm 108 engages the spring 116 which urges the clamping portion 110 into positive engagement with the inserted paper form 25. Movement of the cover to the fully closed position causes the gripping edge of the clamping portion 110 to move the paper form, against a shoulder 117, within the base prior to the imprinting operation. The paper form is not only properly oriented with respect to the underlying printing plate, but is also positively clamped into the oriented position by the clamp 106.

During the imprinting operation, it is necessary that the printing roller 47 be properly spaced from the bottom wall 16 in order to obtain an effective result as the roller 47 passes over the paper form 25 and plate thereunder. Because the manufacture of the parts embodied in the invention necessarily requires some degree of tolerance, and further because the paper forms and printing plates or credit cards employed with the device may vary in thickness in the different applications of use thereof, the roller 47 as mounted in the carriage assembly 36 may not be properly located relative to the bottom wall 16 to provide an effective printing on the paper form 25 during the operation of the device. In order to compensate for any inaccurate placement of the roller 47 with respect to the bottom wall 16 in the assembly of the device, an adjustment mechanism is provided for the roller assembly 46 and reference is now made thereto.

As described hereinabove, the printing roller 47 is formed with a bore 47a in which an elongated cam 57 is received. The cam 57 has an eccentric bore 58 formed therein for receiving the roller shaft 48, the outer diameter of the cam 58 being dimensioned so as to be received within the bore 47a of the roller 47 in bearing relation therein. In this connection the roller 47 is formed of a metallic material that is sufficiently hard to insure an effective printing operation as it rolls over the paper form 25 and printing plate thereunder. The cam 57 is preferably formed of a plastic material such as "Delrin" coated with "Teflon" and forms an effective bearing surface for the metallic roller 47 that is received thereon and for the shaft 48 that is also metal and that is received in the eccentric bore 58. Formed as an integral part of the cam 57 and located at an end thereof is the wheel 59 in which a plurality of radially extending notches 136 are formed. Mounted on the cross member 44 of the carriage assembly 36 is an adjustment member generally indicated at 124 that includes an arm 128 in which elongated spaced slots 130 are formed. An arm 132 is joined to the arm 128 at right angles thereto and has a finger 134 joined to the end thereof that is receivable in a notch 126 of the wheel 59. The slots 130 formed in the arm 128 are aligned with threaded openings 136 that are formed in the cross member 44, the threaded openings 136 receiving screws 138 therein. It is seen that when the screws 138 extend through the elongated slots 130 and are secured in the threaded openings 136, the adjustment member 124 together with the wheel 59 and cam 57 will be firmly fixed to the carriage assembly 36. However, since the slots 130 are elongated, loosening of the screws 138 will enable the adjustment member 124 to be moved relative to the carriage assembly 36 to retract the finger 134 from a notch 126 in the wheel 59 whenever an adjustment of the roller 47 is necessary.

As illustrated in FIG. 1, when the roller 47 is mounted for movement in the carriage assembly 36, the axis of the roller 47 is located in eccentric relation with respect to the axis of the shaft 48, since the shaft 48 is disposed in the eccentric bore 58 of the cam 57. However, since the roller 47 is located in concentric relation on the outer surface of the cam 57, it will also freely rotate thereon. The adjustment of the roller 47 with respect to the bottom wall 16 of the base 12 after the device has been assembled is accomplished by rotating the cam 57 relative to the shaft 48, which movement shifts the axis of the roller 47 relative to the axis of the shaft 48. Shifting of the roller axis is carried out by loosening the screws 138, retracting the finger 134 from a notch 126 in the wheel 59 and then rotating the wheel 59. In order to accurately fix the roller 47 in that position which properly locates it relative to the paper form 25 as positioned on the bottom wall 16 of the base, the cover 12 is closed after the finger 134 has been retracted from the wheel 59, but before adjusting the wheel 59. As illustrated in FIGS. 1 and 3, an opening 140 is formed in the bottom wall 16 of the base, the opening 140 being located in that position which overlies the area on the bottom wall 16 that receives the credit card. Thus with the cover 14 closed on the base 12, the handle 78 is pulled to locate the roller 47 over the credit card area, the wheel 59 then being in alignment with the opening 140. The wheel 59 is now rotated to locate the roller 47 in that position that will cause it to make firm contact with the paper form 25 as located over a credit card on the base 16. When this position has been obtained, the cover 14 is released from the base 12 and the finger 134 is moved into the appropriate notch of the wheel 59 opposite thereto, and the adjustment member 124 is fixed in the adjusted position by tightening the screws 138.

After the device has been in operation for a period of time, if adjustment of the roller 47 is necessary, the cam 57 may be rotated as previously described by loosening the adjustment member 124, retracting the finger 134, and rotating the wheel 59, wherein the axis of the roller 47 is shifted relative to the axis of the shaft 48, thereby changing the position of the roller 47 relative to the bottom wall 16.

In use of the imprinting device as described and with the roller 47 having been adjusted to an appropriate location relative to the bottom wall 16 of the base 12, a printing plate such as a credit card is inserted into the slot 23 in the side wall 17 of the base 12 and thereafter the paper form 25 is placed over the credit card on the base 12. The cover 14 is then moved to a latched posi-
tion, and a printing operation is carried out by pulling outwardly on the handle 78, which action carries the imprinting roller therewith over the paper form 25. As the roller 47 moves over the paper form, the pressure exerted by the roller causes the embossed lettering appearing on the printing plate to be reproduced on the paper form, as is well known in the art. As the handle 78 reaches the outermost position thereof, the knock-off member 98 engages the latch plate 60 to release the cover from engagement with the base. Thereafter the paper form 25 and credit card are removed from the device for further handling.

What is claimed is:

1. An imprinting device of the type in which a printing plate is employed for transferring information from the printing plate to a paper form, a base on which said plate and paper form are received, said paper form overlying said plate in the imprinting operation, a cover pivotally connected to said base at an end thereof, means for locking said cover on said base in an operating position, a carriage mounted in said cover for translating movement longitudinally of said cover, a roller mounted on said carriage for movement therewith and for imparting a rolling pressure on said paper form and plate after said cover is locked in the operating position on said base, said roller having an axial bore extending therethrough, means operatively interconnected to said carriage for manually moving said carriage and roller for carrying out the imprinting operation, and means for adjusting the position of said roller relative to said paper form and plate in order to effect a proper printing action of said plate on said printing form, said adjusting means including an elongated cam mounted on said carriage and having an eccentric bore formed therein, said cam being received in the axial bore formed in said roller and extending the full length thereof, the axis of the bore in said roller being concentric with the axis of said cam but eccentric with respect to the bore formed in said cam, a shaft mounted on said carriage and being independent of and rotatable relative to said elongated cam, said shaft projecting outwardly of said roller and cam for receiving bearing rolls thereon and being received in the eccentric bore of said elongated cam, wherein the roller is mounted for movement on said elongated cam and in eccentric relation with respect to said shaft, and an adjustment wheel fixed to an end of said elongated cam for adjustably rotating the elongated cam relative to said shaft, thereby varying the eccentricity of said roller relative to said shaft so as to adjust the position of the roller relative to the paper form as received on said base, and means for releasably retaining the adjustment wheel in an adjusted position.

2. An imprinting device as set forth in claim 1, said retaining means including a lock element movably secured to said carriage and normally engaging said adjustment wheel for locking said carriage, wherein the axes of said cam and the roller mounted for rotation thereon are fixed relative to the axis of said shaft.

3. An imprinting device as set forth in claim 1, said retaining means including means located on said carriage for locking the wheel in a fixed position thereon, wherein the axes of said cam and the roller mounted for rotation thereon are fixed relative to the axis of said shaft, said locking means including a lock element that is movable in a direction that is parallel to the axis of said roller for engagement with said adjustment wheel for fixing the wheel in the desired adjusted position thereof.

4. An imprinting device as set forth in claim 3, said locking means further including an arm having adjustment slots formed therein, fastening means extending through said slots for engagement with said arm and carriage to adjustably secure said locking means to said carriage, wherein loosening of said fastening means provides for movement of said arm and lock element to enable said wheel and cam to be rotated to the required adjusted position with respect to said shaft, whereafter said lock element is moved into said engagement with said wheel and is locked therein by tightening the fastening means and arm in engagement therewith on said carriage.

5. An imprinting device as set forth in claim 1, bearing rolls located on the outer ends of said shaft and being received in longitudinal tracks formed in said cover, said bearing rolls supporting said roller for movement and providing for relatively free movement of said carriage in the operation of said device.

6. An imprinting device as set forth in claim 1, said wheel having a plurality of notches formed in the periphery thereof, and said lock element having a finger that is receivable in a selected notch of said wheel after the adjustment thereof, and means for fixing said lock element to said carriage after adjustment of said wheel and location of said finger in a selected notch.

7. An imprinting device as set forth in claim 6, said cover having an opening formed therein that is located in alignment with the notched wheel when the cover is located in the closed position thereof, and the roller has been moved over the area in which the plate is located on said base, wherein the cam is rotatable to adjust the position of said roller relative to the base.