

[54] **PRINTING APPARATUS**
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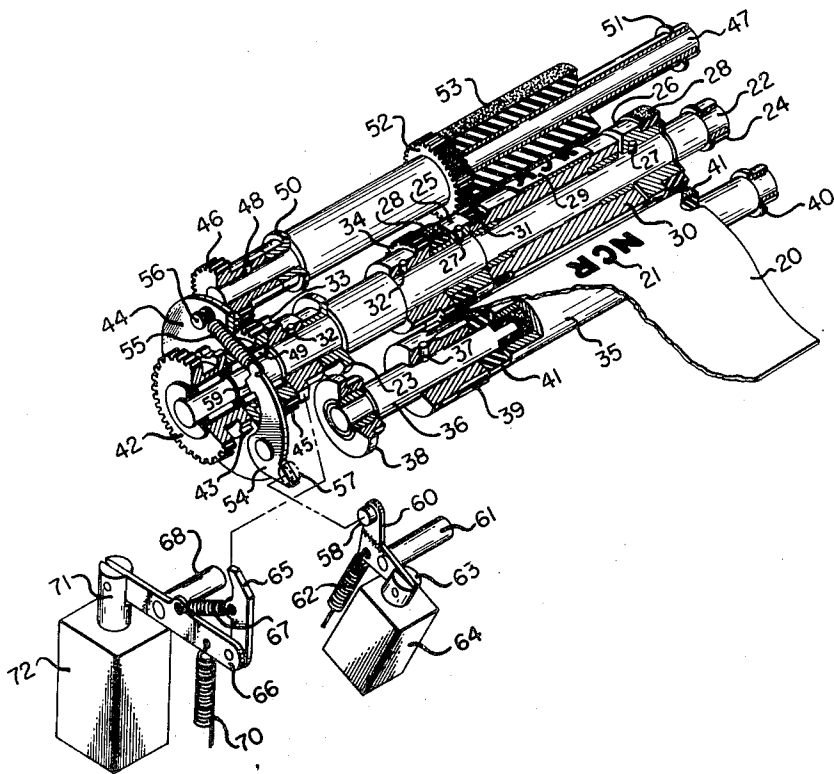
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[57] **ABSTRACT**
A compact printing and feeding apparatus for use in an electronic cash register or other type of data terminal which includes a pair of feed rolls mounted on a shaft which supports independently a printing cylinder, the feed rolls engaging corresponding pressure rolls for feeding, when operated, a record member positioned therebetween, a drive shaft positioned adjacent the feed roll shaft on which is independently mounted a reinking member which engages and is driven by the printing cylinder. The drive shaft has also mounted thereon a drive member which engages and operates the printing cylinder to print a logo on the record member. The apparatus includes independently operated actuating means for selectively operating the feed roll shaft and the drive shaft to provide independent feed and print and feed operations.

11 Claims, 1 Drawing Figure



PRINTING APPARATUS

BACKGROUND OF THE INVENTION

In present day electronic cash register and data terminals, a reduction in size of the overall machine has been achieved through the use of electrical components. This reduction has required that those mechanisms of the machine which are mechanical in nature operate in areas which are quite limited and still function in their intended manner. In the case of printing on the merchandise receipt, prior mechanisms for moving the receipt for printing during an item checkout and the subsequent printing of a logo or other type of advertisement on the receipt as part of the last printing operation have been separate and distinct, thereby resulting in complicated and large assemblies which have been high in cost. The most common apparatus for printing logos has been of a flat-bed type which required a large amount of room. It is therefore an object of this invention to provide a compact and integral print and feed mechanism which allows both a feed and a print and feed operation to occur and which is relatively simple in construction and therefore low in cost. It is a further object of this invention to provide a compact print mechanism which provide a reinking operation to occur simultaneously with the print operation.

SUMMARY OF THE INVENTION

In order to fulfill these objects, there is provided a mechanism for selectively printing on and feeding a record member which includes a rotatably mounted first shaft member on which is mounted feed rolls and which rotatably supports a printing cylinder, a second shaft member rotatably mounted adjacent said first shaft member to which is fixed a drive member drivingly engaging said printing cylinder, and which rotatably supports a reinking member engaging and driven by said printing cylinder, pressure rolls engaging the feed rolls and driven thereby to feed a record member positioned therebetween and selectively operated control means for actuating the first and second shaft members to provide independent feed and print and feed operations.

BRIEF DESCRIPTION OF THE DRAWING

The drawing shows a partial cut-away oblique view of the print and feed mechanism with portions of various elements of the mechanism cut away to clarify their construction and showing the relative location of the solenoids by the use of dashed lines.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, there is shown the printing mechanism used in a data terminal or other business machine for selectively feeding and printing on a receipt member 20 a logo 21 which includes a shaft 22 journaled in bearings 23, 24 each supported within the framework of the machine and to which is mounted a pair of feed rolls 25, 26 by means of pins 27. Each feed roll includes an elastic drive portion 28 which may be of rubber or some other type of composition. Rotatably mounted on the shaft 22 and positioned between the feed rollers 25, 26 is a printing cylinder 30 which prints the logo 21 by means of a printing die 29. One end of the cylinder 30 is composed of a gear portion 31 which is used in rotating the cylinder 30 during

a printing operation as will be described more fully hereinafter.

Also secured to the shaft 22 by means of pins 32 is a ratchet wheel 33 and a gear member 34. The gear member 34 engages the splined portion 39 of a pressure roller assembly 35 secured to a shaft 36 by means of a pin 37. The shaft 36 is journaled in bearings 38, 40 mounted within the framework (not shown) of the business machine. The pressure roller assembly 35 includes a pair of pressure rolls 41 composed of elastic material which is the same as the elastic material 28 of the feed rolls 25, 26 and which engage the feed rolls 25, 26. As will be described more fully hereinafter, rotation of the shaft 22 will also rotate shaft 36 through the engagement of the splined portion 39 of the pressure roller assembly 35 by the gear member 34.

Rotatably mounted on one end of the shaft 22 is a constantly rotating gear member 42 driven by a motor (not shown). The gear member 42 has a clutch wheel portion 43 adjacent to which is mounted a clutch plate 44. The clutch plate 44 has a gear portion 45 which engages a gear member 46 pinned to a shaft 47 by the pin 48. The shaft 47 is journaled within the framework (not shown) of the business by means of bearings 50, 51. The clutch plate 44 engages the shaft 22 in a driving relationship by means of a roller clutch member 49. Secured to the shaft 47 is a gear member 52 which engages the gear portion 31 of the printing cylinder 30. Also rotatably mounted on the shaft 47 is reinking roll 53 which engages the printing die 29 mounted on the printing cylinder 30. It is obvious from this construction that rotation of shaft 47 will result in the rotation of the printing cylinder 30, the printing die 29 and the reinking roll 53 to provide an automatic printing and reinking operation.

Rotatably mounted on the clutch plate 44 is a clutch pawl 54 normally urged in a direction by a spring 55 to allow a projection 59 on the pawl to engage the clutch wheel portion 43 of the constantly rotating gear member 42. The spring 55 is mounted between a stud 56 located on the clutch plate 44 and the clutch pawl 54. The clutch pawl 54 has a stop surface 57 which is normally engaged by a stud 58 mounted on the end of a lever arm 60. The lever arm 60 is rotatably mounted on a shaft 61 secured to the framework (not shown) of the business machine. The arm 60 is engaged by a spring 62 which normally urges the arm 60 in a counter-clockwise direction allowing the stud 58 to rock the clutch pawl 54 in a clockwise direction. The other end of the arm 60 is rotatably secured to the armature 63 of an electromagnet 64. Energizing of the electromagnet 64 will result in the arm 60 being rocked in a clockwise direction as viewed in the drawing.

Associated with the ratchet wheel 33 is a ratchet pawl 65 rotatably mounted on one end of a lever arm 66. The pawl 65 is normally urged in a counter-clockwise direction as viewed in the drawing by a spring 67 mounted between the arm 66 and the pawl 65. This movement positions the pawl 65 into engagement with the ratchet wheel 33. The lever arm 66 is rotatably mounted on shaft 68 which is secured to the machine framework. One end of the arm 66 is engaged by a spring 70 while the other end is rotatably secured to the armature 71 of an electromagnet 72. Energizing of the electromagnet 72 will move the armature 71 in a downward direction thereby rocking the arm 66 in a counter-clockwise direction against the action of the

spring 70. This rotation will move the pawl 67 in a generally vertical direction thereby moving the ratchet wheel 33 and shaft 22 in a counter-clockwise direction. As will be described more fully hereinafter, this movement of the pawl 67 will rotate the feed rolls 26, 28 in a step-by-step feed operation.

In the operation of the printing apparatus, the structure of the printer described above provides two machine operations in which movement of the receipt is required. The first operation concerns the printing of the items being sold, their cost and the total of the transaction on the sales receipt which is to be given to the customer at the conclusion of the transaction. The second machine operation is the printing of a logo or other type of advertisement on the receipt prior to giving the receipt to the customer.

As part of the merchandizing transaction, the operator will index the information on each item that is sold into the data terminal which, upon subsequent operation of the machine, will be printed on the receipt member. As part of this machine operation, the solenoid 72 will be energized resulting in the ratchet pawl 65 engaging the ratchet wheel 33, thereby rotating the wheel 33 and shaft 22 in a counter-clockwise direction as viewed in the drawing. Rotation of the shaft 22 results in the gear member 34 rotating the pressure roller assembly 35 and shaft 36. This rotation of shafts 22 and 36 will allow the feed rolls 25, 26 together with the pressure rolls 41 feed the receipt member 20 a distance to accommodate a line of printing. Each subsequent printing operation will be preceded by the energizing of the solenoid 72. After the shafts 22 and 36 have been rotated by the pawl 65, the solenoid 72 will be deenergized allowing the spring 70 to return the pawl 65 to its home position.

When the machine is operated in a total mode in which the transaction total is to be printed, the solenoid 72 will again be operated in the manner described previously to advance the receipt member to a position where the totals are printed. At the end of this printing operation, the solenoid 64 will be energized rocking the arm 60 in a clockwise direction releasing the pawl 54 and allowing the spring 55 to rock the pawl 54 counter-clockwise resulting in the latching of the projection 59 of the clutch pawl 54 by the clutch wheel portion 43 of the driving gear member 42. This latching action couples the clutch plate 44 and gear member 45 to the driving gear member 42. The rotation of the gear member 45 will be transmitted to the shaft 48 by means of gear member 46 and to shaft 22 by means of the roller clutch member 49.

Rotation of the shaft 47 will allow the gear member 52 to rotate the printing die 20, which is rotatably mounted on shaft 22, by means of the gear portion 31. Rotation of the printing die 29 will also result in the rotation of the reinking roll 53 due to the contact pressure between the die and the reinking roll resulting in the reinking of the printing die 29 during rotation of the die. Rotation of the shaft 22 will result in the rotation of the shaft 36 due to the engagement of the gear member 34 pinned to shaft 22 and the spline portion 39 of the pressure roll assembly 35. As was described previously, this coaction between the shafts 22 and 36 will result in the feed rolls 26, 28 and the pressure rolls 41 feeding the receipt member 20 through a predetermined distance during which time the printing die 29 will print a logo 21 on the receipt member 20. It will be

seen from this structure that all three shafts 48, 72 and 36 are operated to provide the printing of the logo together with the feeding of the receipt member.

The solenoid 64 is deenergized after the clutch plate 44 has started its rotation. This action results in the spring 62 returning the arm 60 and the stud 58 to a blocking position to engage the extension 57 of the clutch pawl 54 after the pawl has been rotated one revolution. This engagement will disengage the pawl from the clutch member 43, thus stopping the rotation of the shafts 48, 22 and 36. If further feeding of the receipt is to occur without the printing of the logo 21, the solenoid 72 will be energized as many times as it is required to feed the receipt member to a position where it can be removed from the machine and given to the customer.

It will be seen from the foregoing detailed description that the present invention provides a very compact, relatively simple and inexpensive printing apparatus for printing logos on a receipt which can be used in electronic cash registers and data terminals where space is not available for conventional flat-bed type bed printing devices.

What is claimed is:

1. An apparatus for selectively feeding and printing on a record member comprising:

- a. a rotatably mounted support member;
- b. a printing member rotatably mounted on said support member for movement relative to said support member for printing data on a record member;
- c. feed means secured to said support member for feeding a record member a distance commensurate to the rotation of said support member;
- d. a first actuating means for rotating said support member independently of said printing member, when operated, a first predetermined distance whereby the feed means will feed the record member a distance commensurate with the rotation of said support member;
- e. and second actuating means for simultaneously rotating said support member and said printing member, when operated, a predetermined distance whereby the printing member will print data on the record member during movement of the record member by said feed means.

2. The apparatus of claim 1 which includes a second feed means engaging said feed means and operated by rotation of said support member for feeding a record member positioned between said feed means and said second feed means.

3. The apparatus of claim 2 which includes:

- a. a first drive member mounted on said printing member;
- b. said second feed means includes a second rotatably mounted support member positioned adjacent said support member and operated by rotation of said support member;
- c. a feed member mounted on said second support member for feeding a record member positioned between said feed means and said feed member upon rotation of said second support member;
- d. and said second actuating means includes a third rotatably mounted support member positioned adjacent said support member;
- e. drive means operatively engaging said support member and said third support member for simul-

- taneously rotating said support members when operated;
- f. and a second drive member mounted on said third support member and engaging said first drive member to rotate said printing member upon rotation of said third support member whereby said printing member and said feed member are rotated upon operation of said drive means.
4. An apparatus for selectively feeding and printing on a record member comprising:
- a first rotatably mounted shaft member;
 - a pair of feed rolls mounted on said shaft member;
 - a printing cylinder rotatably mounted on said shaft member between said feed rolls, said printing cylinder having a driving portion located thereon;
 - means rotatably mounted adjacent said feed rolls and engaging said feed rolls for moving a record member positioned therebetween upon rotation of said first shaft member;
 - a second shaft member rotatably mounted adjacent said first shaft member;
 - a drive member secured to said second shaft member and engaging the driving portion of said printing cylinder;
 - a reinking member mounted on said second shaft member and engaging said printing cylinder to reink said printing cylinder upon rotation of said printing cylinder;
 - first actuating means engaging said first shaft member for rotating said first shaft member when operated whereby said feed roll and said engaging means will feed a record member positioned therebetween a first predetermined distance commensurate with the rotation of said first shaft member;
 - and second actuating means engaging said first and second shaft members for simultaneously rotating both of said shaft members, when operated, whereby said printing cylinder will print on a record member being moved a second predetermined distance by said feed roll and engaging means, said printing cylinder being reinked by said reinking member during the printing operation.
5. In a data terminal device in which data generated during operation of said device is printed on a record member, a feeding and printing apparatus for printing a logo on the record member comprising:
- a first rotatably mounted shaft member;
 - a printing member for printing a logo on a record member rotatably mounted on said first shaft member;
 - a feed roll mounted on said shaft member for engaging and feeding a record member a distance commensurate with the rotation of said first shaft member;
 - a second shaft member rotatably mounted adjacent said first shaft member;
 - first drive means interconnecting said first and second shaft members whereby said second shaft member is rotated by rotation of said first shaft member;
 - a pressure roll mounted on said second shaft member and engaging said feed roll for feeding a record member positioned therebetween upon rotation of said first shaft member;
 - a third member rotatably mounted adjacent said first shaft member;

- second drive means interconnecting said third shaft member and said printing member whereby said printing member is rotated to print a logo on a record member upon rotation of said third shaft member;
 - a first selectively operated actuating means engaging said first shaft member to rotate said first shaft member a first predetermined distance when operated whereby the feed and pressure rolls will move a record member positioned therebetween a distance commensurate with the amount of rotation of said first shaft member;
 - and a second selectively operated actuating means engaging said first and third shaft members to simultaneously rotate said shaft members a second predetermined distance whereby said printing member will print a logo on the record member being moved by said feed and pressure rolls.
6. The printing apparatus of claim 5 which includes a reinking member rotatably mounted on said third shaft member and which engages said printing member to reink said printing member upon rotation of said printing member to print a logo on the record member.
7. The printing apparatus of claim 6 in which a ratchet wheel is mounted on said first shaft member, said first actuating means includes a ratchet pawl mounted adjacent said ratchet wheel and a selectively operated actuating member engaging said ratchet pawl whereby upon operation of said actuating member, said ratchet pawl engages and rotates said ratchet wheel and said first shaft member a predetermined distance.
8. The printing apparatus of claim 7 which includes:
- a first drive member secured to said third shaft member;
 - said second actuating means includes a continuously operating drive means;
 - a first normally disengaged clutch means connected to said first drive member for connecting said continuously operating drive means to said first drive member when actuated;
 - a second clutch means operatively connected to said first shaft member and said first clutch means and operable to connect said first shaft member to said continuously operative drive means upon actuation of said first clutch means;
 - and a second selectively operated actuating member normally holding said first clutch means in a disengaged position, said second actuating member operable to actuate said first clutch means whereby said first and third shaft members are operated by said continuously operating drive means.
9. The printing apparatus of claim 8 in which said first clutch means includes a second drive member rotatably mounted on said first shaft member and which engages said first drive member whereby operation of said second actuating member will interconnect the continuously operating drive means to said second drive member to operate said third shaft member.
10. The printing apparatus of claim 9 in which said second clutch means comprises a roller clutch member positioned between said second drive member and said first shaft member to couple the rotation of said second drive member to said first shaft member.
11. In a data terminal apparatus constructed and operated to print data on a record member, an apparatus for selectively feeding and printing a logo on a record member comprising:

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- a. a first rotatably mounted shaft member having a first gear member and a pair of feed rolls secured thereto;
- b. a logo printing cylinder rotatably mounted on said first shaft member, said cylinder having a gear position;
- c. a second shaft member rotatably mounted adjacent said first shaft member and having a second gear member secured thereto, said second gear member engaging said first gear member;
- d. a pair of pressure rolls secured to said second shaft member and engaging said feed rolls for moving a record member positioned therebetween upon rotation of said second shaft member;
- e. a third shaft member rotatably mounted adjacent said first shaft member and having a third gear member secured thereto and engaging the gear portion of said printing cylinder for rotating said cylinder upon rotation of said third shaft member;
- f. a reinking member rotatably mounted on said third shaft member and engaging said printing cylinder for rotation thereby;
- g. a first electrically operated drive means positioned adjacent said first shaft member for rotating, when operated, said first shaft member a first predetermined distance whereby a record member positioned between the feed and pressure rolls will be

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- moved a distance commensurate with the rotation of said first shaft member;
- h. a constantly operating drive means positioned adjacent said first shaft member;
- i. a first drive gear member secured said third shaft member;
- j. a second drive gear member engaging said first drive gear member and rotatably mounted on said first shaft member;
- k. a first clutch means operatively engaging said constantly operating drive means and said second drive gear member for connecting said drive means to said gear member when operated;
- l. a second clutch means operatively engaging said second drive gear member and said first shaft member for connecting said shaft member to said gear member upon rotation of said second drive gear member;
- m. and a second electrically operated drive means engaging said first clutch means for actuating said first clutch means, when operated, whereby said first and third shaft members are rotated a second predetermined distance by said constantly operating drive means to bring a logo on the moving record member.

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