July 16, 1929. J. E. HYDEMAN 1,721,397

PROCESS OF PRINTING

Filed Nov. 29, 1927 4 Sheets-Sheet 1

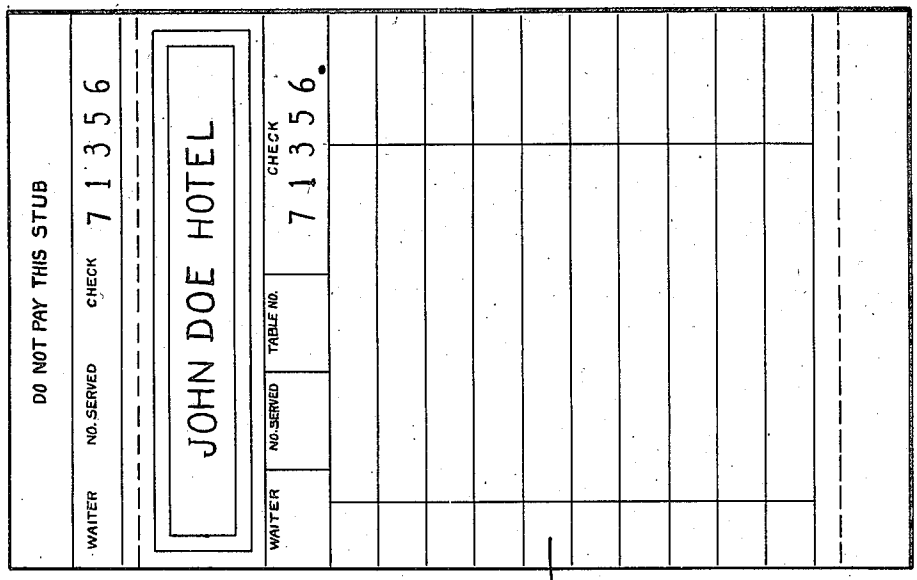


FIG. 2

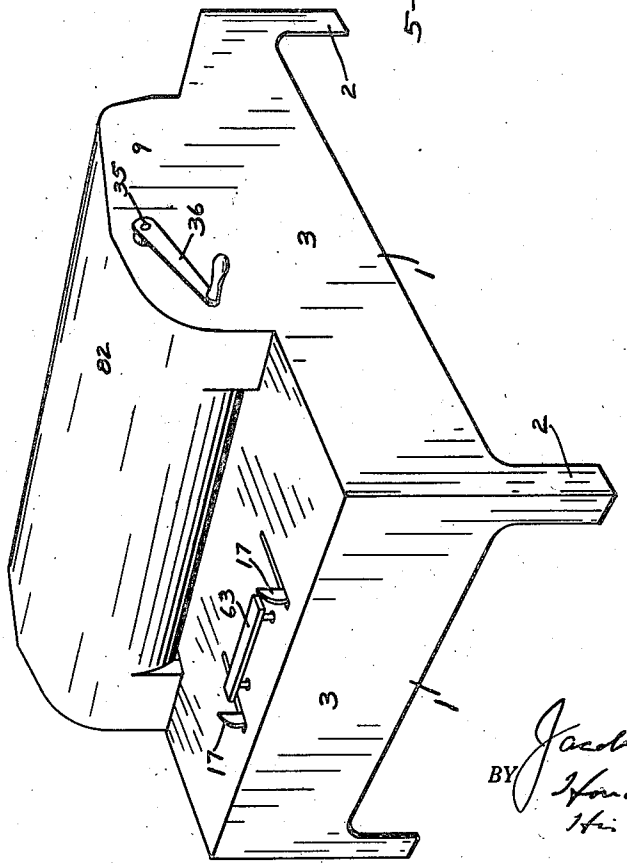


FIG. 1

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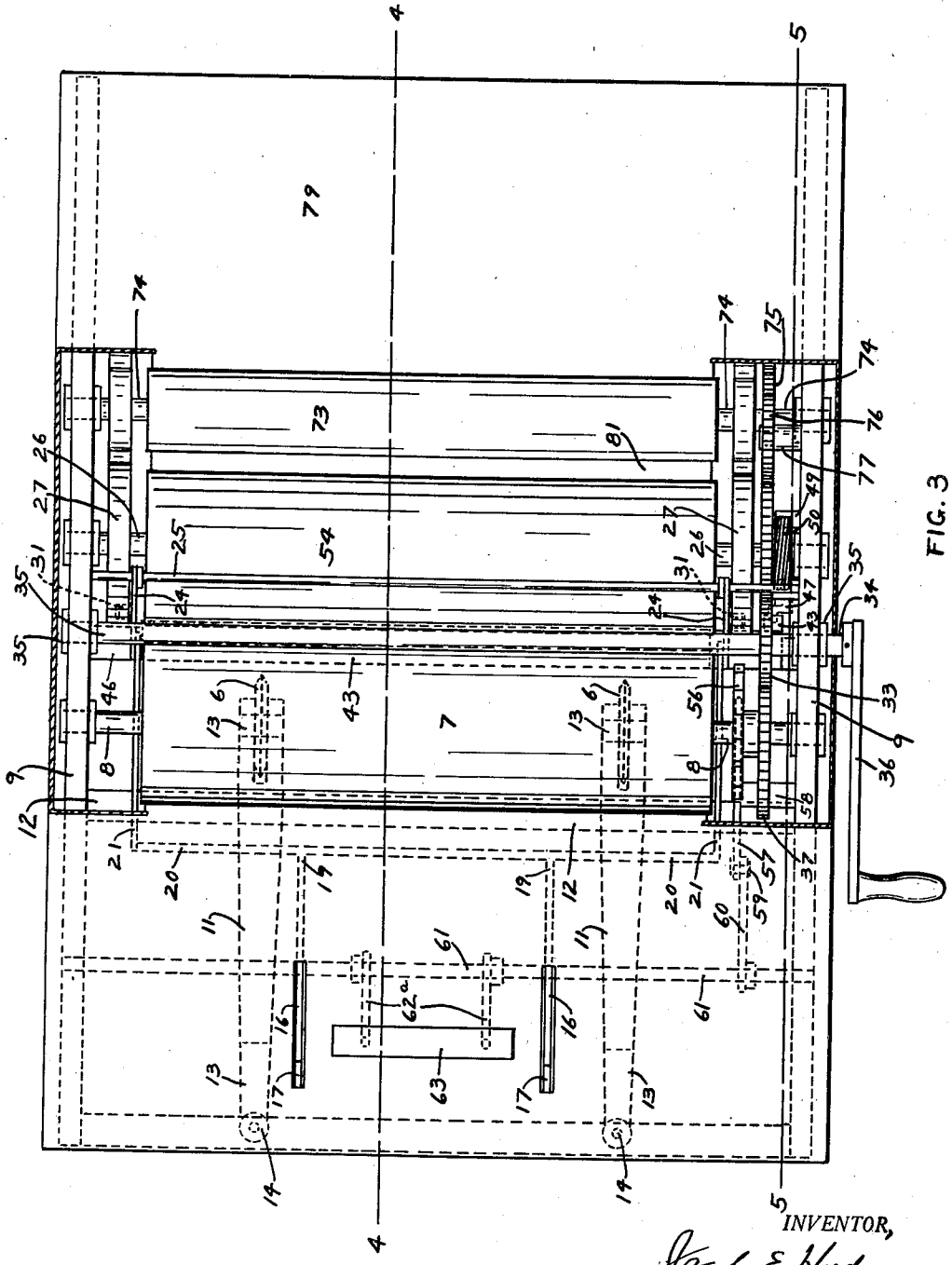


FIG. 3

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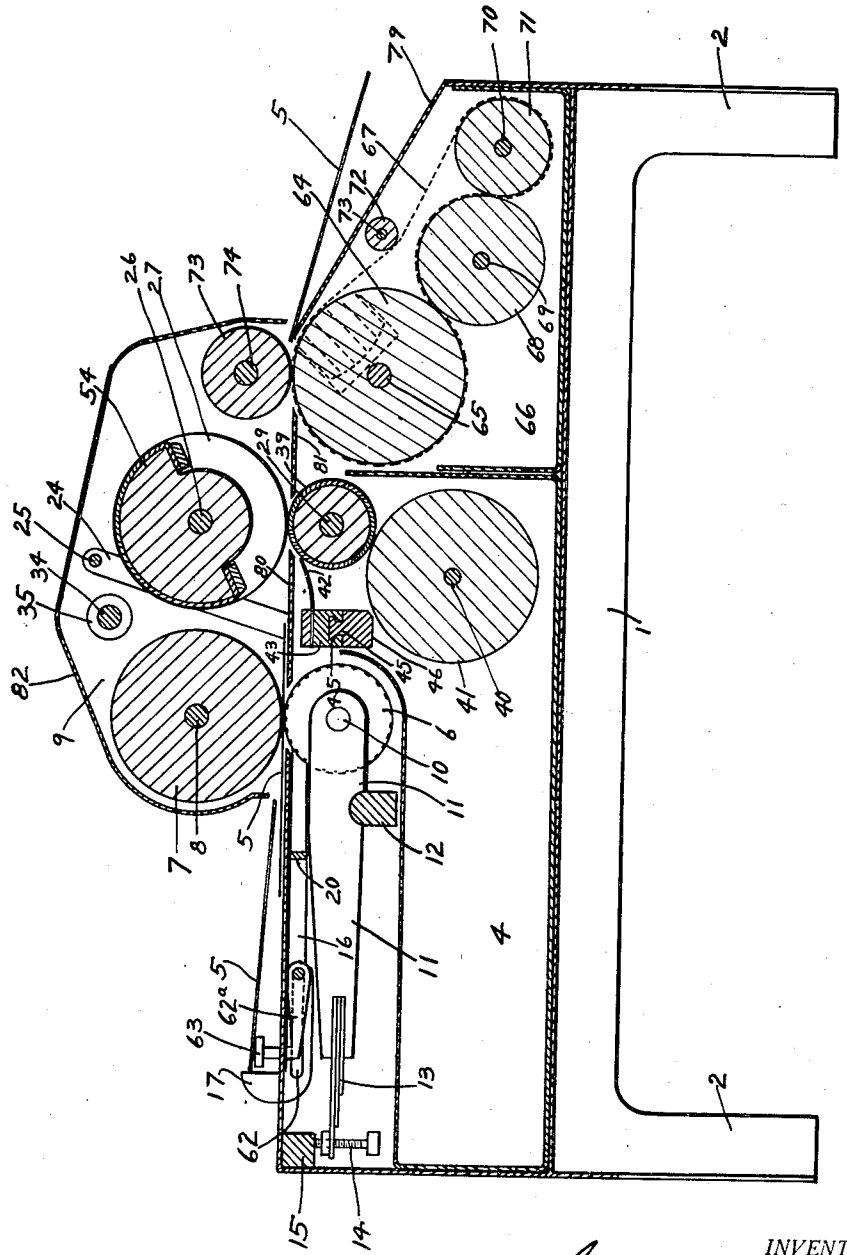


FIG. 4

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July 16, 1929. J. E. HYDEMAN 1,721,397

PROCESS OF PRINTING

Filed Nov. 29, 1927 4 Sheets-Sheet 4

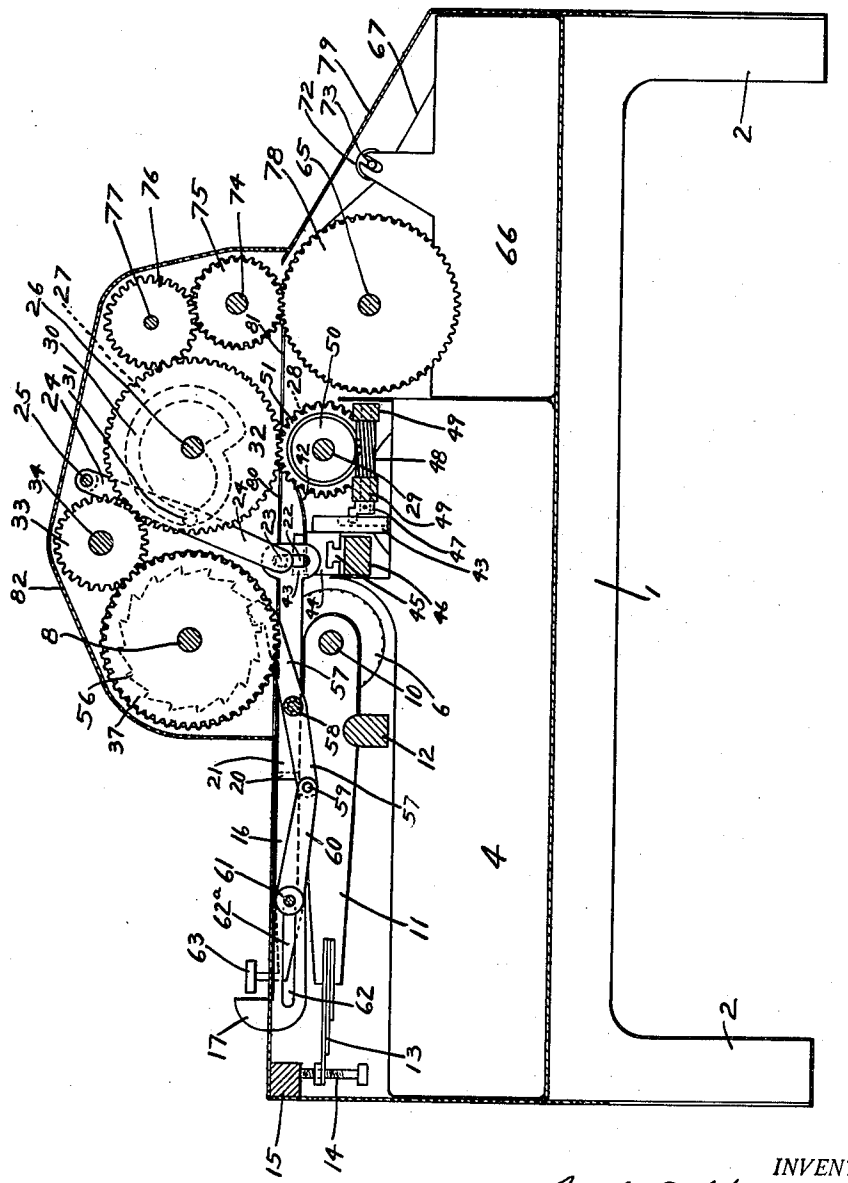


FIG. 5

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Patented July 16, 1929. 1,721,397

UNITED STATES PATENT OFFICE.

JACOB E. HYDEMAN, OF DAYTON, OHIO.

PROCESS OF PRINTING.

Application filed November 29, 1927. Serial No. 236,424.

This invention relates to a new and useful method of printing.

It is one of the principal objects of my invention to provide a method whereby service checks such as those issued in hotels, restaurants, garages and other places may be printed with an ink which remains non-drying during the entire period of use of the check. Such checks used at once without the undue smearing of the ink or the soiling of the hands of those persons who issue and receive them. Although any suitable means may be employed for achieving this result, I employ a non-drying or an extremely slow drying oil base for the ink. This base may be of oleic acid, castor oil, mineral oil or any other like substance which has been colored to the desired shade by grinding or mixing it with any suitable dye or dry color.

It is another object of my invention to use my non-drying ink with an intaglio printing process, which lends itself to the use of such an ink very nicely. The use of the intaglio process with a non-drying oil ink will produce a card, strip or sheet that may be used almost instantly after it is printed.

It is another object of my invention to provide an absorbent paper or card to which my non-drying ink will adhere without drying during the entire period of use of the check, and which may be used at once without danger of the ink smearing or soiling the hands. All printed matter must be given time to dry in a printing plant before it is practical to deliver it to the customer for use, whereas under my process the customer produces his own printing with a non-drying ink which will not dry in the machine or on the issued paper, but which may be used at once without soiling the hands.

In the accompanying drawings, Figure 1 is a perspective view of my machine for printing cards or checks which may be used at once. Figure 2 is a plan view of one of the cards or checks which is perforated, printed, numbered and issued by the machine. Figure 3 is a plan view of the machine, with the upper cabinet portion removed to show the rolls. Figure 4 is a longitudinal, sectional view taken through the machine on the line 4—4 of Figure 3, showing a card entering the machine, a card between the perforating rolls and a card leaving the numbering rolls. And Figure 5 is a longitudinal, sectional view taken through the machine, on the line 5—5 of Figure 3, showing the gears and printing mechanism.

My improved method for printing and issuing service checks is preferably carried out by the means I shall now described. Referring to the accompanying drawings for a detailed description of my invention, the numeral 1 designates a machine base supported by legs 2. Mounted upon the base 1 is a cabinet or casing 3 in which a long vat or tank 4 for holding oil ink is placed as shown in Figure 4.

The service cards or checks 5 used in my machine are preferably made of an absorbent paper which will almost instantly absorb the oil ink, thereby permitting them to be used at once. Before being presented to the inking means, these cards or checks 5 are first perforated by sharp-edged perforating wheels 6 which operate in contact with a hard steel cylinder 7 mounted on a shaft 8 journaled in the top portion 9 of the main casing.

The perforating wheels 6 are formed with gaps in their cutting edges to allow a sufficient amount of paper to remain between the slots cut through the paper in a straight line across the check so that the stubs will not fall off but can be severed as desired.

Each perforating wheel 6 is mounted on a spindle 10 journaled in the fork end of a holder arm 11 pivotally secured to a fulcrum cross bar 12 attached to the casing. Secured to the rear end of each holder arm 11 is a leaf spring 13 which carries on its rear end a vertical set screw 14. The upper end of the latter is adapted to engage a stop piece 15 to define the tensional engagement between each perforating wheel 6 and the steel cylinder 7. This tension may be easily adjusted by turning the set screw 14. (See Figures 3 and 4.)

The following means may be employed for presenting the cards 5 to the perforating wheels 6 and the inking rollers beyond. Referring to Figures 3, 4 and 5, the numerals 16, 16 designate two card-receiving slides or guides, each of which is formed with a vertical flanged part 17 at its rear end. These flanged parts of the guides 16, 16 engage the card to move it forward when the guides themselves are advanced by means to be hereinafter described.

At their inner ends 19, the guides 16, 16 are connected to a longitudinally movable cross member 20. The cross member 20 is

connected at its ends to two longitudinally movable bars 21, 21 whose inner ends are enlarged for the formation of vertical slots 22, 22 respectively therein. Projecting into each slot 22 is a pin 23 which pivotally connects it to the lower end of a lever arm 24. Each lever arm 24 is secured at its upper end to a shaft 25 journaled in bearings in the upper cabinet portion 9 of the casing 3. (See Figures 3 and 4.)

The lever arms 24, 24 are actuated by means to be described to draw the guides 16, 16 forwardly when it is desired to advance a card 5 for the purpose of perforating and printing it. Mounted on each end of a shaft 26 journaled in bearings in the side frames of the casing 3, is a spacing roller 27 which rotates in contact with a spacing roller 28 secured to each end of a shaft 29 also journaled in bearings below those for the shaft 26 in said casing. Formed in one face of each roller 27 is a curved cam groove 30 whose contour is preferably that shown in Figure 5. Projecting into the groove 30 of each roller 27 is a pin 31 on the middle portion of each lever arm 24. When the cam rollers 27 are rotated counter clockwise, they will draw the free ends of the lever arms 24, 24 forwardly to advance the guides 16, 16, respectively, and the card 5 that has been placed upon them, for the purpose of perforating and printing the latter through means to be hereinafter described.

For the purpose of rotating the spacing rollers 27, 27, there is mounted upon the shaft 26 a gear 32 which meshes with a gear 33 mounted on a shaft 34 journaled in bearings 35 in the side frames of the casing 2. To one outer end of the shaft 34 there is attached a crank 36, by which it may be conveniently rotated.

For the purpose of printing the desired matter upon a card after it has been perforated by the cylinder 7, there is mounted upon the shaft 29 an intaglio printing cylinder 39. This cylinder, which is preferably made of steel and copper plated on its printing surface, has depressed cells around its entire circumference that carry the complete design for printing all of the body of the check except the numbers, being etched below its surface by a well known method. (See Figure 4.)

Mounted upon a shaft 40 supported by suitable bearings below the printing cylinder 39 in the tank 4, is a wooden roller 41 that is preferably felt-covered and which rotates in contact with said intaglio printing cylinder to ink its surface when the top level of said ink falls below the bottom of the printing cylinder. This ink is preferably made of a colored oil which will be instantly absorbed by the absorbent paper checks 5 to permit them to be used at once and to which it will adhere without drying during their period of use.

For the purpose of wiping the face of the printing cylinder 39 clean, leaving the oil ink only in its etched cells, I have provided a flexible, steel blade 42. This blade is secured to the upper part of a vertical member 43 which is attached at its upper end to a slide 44. This slide is formed in its bottom portion with a dove-tail groove which fits a T-shaped guide 45 on a fixed cross block 46 secured to the casing. (See Figure 5.)

For the purpose of imparting to the blade 42 a slight lateral movement when the printing roller 39 is rotated, there is formed in the vertical member 43 a vertical slot which receives a crank pin 47 on the outer end of a worm gear 48 journaled in bearings 49, 49. This worm is rotated through its engagement by a worm 50 on the printing roller shaft 29. Therefore, when the printing roller 39 is rotated, the crank pin 47 will shift the vertical member 43 laterally to move the wiper blade 42 in the same direction across the etched face of the printing roller to properly wipe it clean without injuring it and at the same time leaving the oil ink only in its etched cells. (See Figure 5.)

The printing roller 39 is rotated by a gear 51 on the shaft 29 that meshes with the gear 32 on the shaft 26. (See Figures 3 and 5.)

For the purpose of bringing the cards 5 into firm printing contact with the etched printing roller 39, I have provided a half-cylinder or turtle 54 which is covered with leather and mounted on the spaced roller shaft 26. It is against the surface of this turtle 54 that the etched cylinder 39 prints the check. This turtle 54 and the printing cylinder 39 are properly spaced at all times by the spacing rollers 27 and 28, which are in engagement with each other as hereinbefore described.

In order to lock the card-advancing mechanism against operation until it is desired to perforate and print a card, the following means may be provided. Referring to Figures 3 and 5, the numeral 56 designates a ratchet wheel mounted on the shaft 8. Adapted to engage the teeth of this ratchet wheel is a pawl 57 which is pivotally secured to a pin 58 projecting inwardly from one side frame of the casing 3. The outer end of the pawl 57 is pivotally secured by a pin 59 to an arm 60 secured to a cross shaft 61 journaled in the side frames of the casing. The cross shaft 61 supports the guides 16, 16 during their longitudinal movement, and to permit this movement they are provided with slots 62, 62, through which said cross shaft projects. (See Figures 3 and 5.)

For the purpose of rotating the shaft 61 to release the pawl 57 from the teeth of the ratchet 56, there is secured to said shaft between the slides 16, 16, two arms 62^a, 62^a, to whose outer ends there is attached a depression bar 63. The latter may be conveniently depressed by a finger to unlock the card-ad-

vancing mechanism. The crank 36 may then be rotated to move the guides 16, 16 forwardly to present a card 5 thereon to the perforating cylinder 7. This card, after being perforated, is carried beyond this cylinder by the guides 16, 16 to the printing cylinder 39 by which the desired matter is printed upon its absorbent surface with the non-drying ink received from the tank 4.

The card is now advanced to the numbering mechanism which will next be described. Referring to Figures 3, 4 and 5, the numeral 64 designates a consecutive numbering cylinder for printing the numbers on a check 5. This cylinder is mounted on a shaft 65 supported in a vat or tank 66 in the front part of the cabinet 3 for containing ink similar to that used for rubber stamping work, being of a fluid nature and very slow in drying, or non-drying. An endless inking ribbon 67 passes through this ink around the cylinder 64 from an intermediate cylinder 68 mounted on a shaft 69 below and in front of the shaft 65. Secured on a shaft 70 in front of the shaft 69 journaled in bearings within the ink tank 66 is a roller 71 covered with a resilient material such as leather, the cylinder 68 being preferably made of felt discs. The function of the cylinder 71 is to squeeze all of of the ink out of the ribbon 67 after it passes down through the ink contained in the tank 66. For the purpose of keeping the inking ribbon 67 taut at all times I provide a conventional, adjustable idler 72 mounted on a shaft 73 for engagement with the upper surface of said ribbon above the cylinder 68.

Adapted to engage the numbering cylinder 64 from above is an impression roller 73 mounted on a shaft 74 journaled in bearings in the upper portion 9 of the casing 3. Also mounted on this shaft is a gear 75 in mesh with a gear 76 secured to a stud 77 journaled in bearings in the upper part 9 of the cabinet 3. This gear 76 is driven by the gear 32 on the shaft 26. (See Figures 3 and 5.)

The numbering roller 64 is rotated clockwise by a gear 78 mounted on the shaft 65, and which meshes with the gear 75 on the shaft 74. Thus it is seen that the numbering cylinder 64 and the impression roller 73 are rotated to number a card 5 advanced to them by the etched printing cylinder 39. This card is then ejected by the numbering rolls upon the downwardly inclined front plate portion 79 of the cabinet 3 ready for instant use. (See Figure 4.) The absorption of the non-drying ink by the absorbent paper of the check makes this possible.

An absorbent card or check 5 which may be perforated, printed and numbered by my improved machine is shown in Figure 2. Such a check is designed for service in hotels and restaurants, and, when printed and numbered by the oil ink rollers, may be used immediately.

Between the cylinder 7 and the turtle 54 there is a plate 80 over which the check or card 5 travels to the etched printing cylinder 39, and between the latter and the numbering rolls 64 and 73, there is a plate 81 over which said card passes to said rolls. (See Figure 4.)

The upper portion 9 of the cabinet 3 is closed by a cover 82 which may be easily removed to permit access to the enclosed mechanism.

Having described my invention, I claim:

1. The herein described method of printing an absorbent paper that may be used at once, which consists in employing a non-drying ink in the intaglio printing process for printing upon said paper.

2. The herein described method of printing on absorbent paper that may be used at once, which consists in employing a non-drying oil ink in the intaglio process for printing upon said paper.

3. The herein described process of printing media for immediate distribution, which consists in printing with a non-drying ink upon an absorbent medum to which the ink will adhere without drying during the entire period of the use of said medium.

4. The herein described process of printing service checks for immediate distribution, which consists in making them of absorbent material and then printing upon them with an ink which remains non-drying during the entire period of their use.

5. The herein described process of printing service checks for immediate distribution, which consists in making them of absorbent material and then printing upon them with an oil ink which remains non-drying during the entire period of their use.

In testimony whereof I have hereunto set my hand this 26th day of November, 1927.

JACOB E. HYDEMAN.