

March 8, 1960

E. J. JANKE
CODE PRINTING MACHINE

2,927,528

Filed Sept. 23, 1957

5 Sheets-Sheet 1

Fig.-1

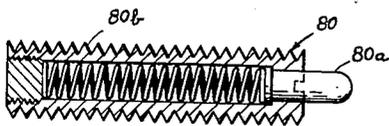
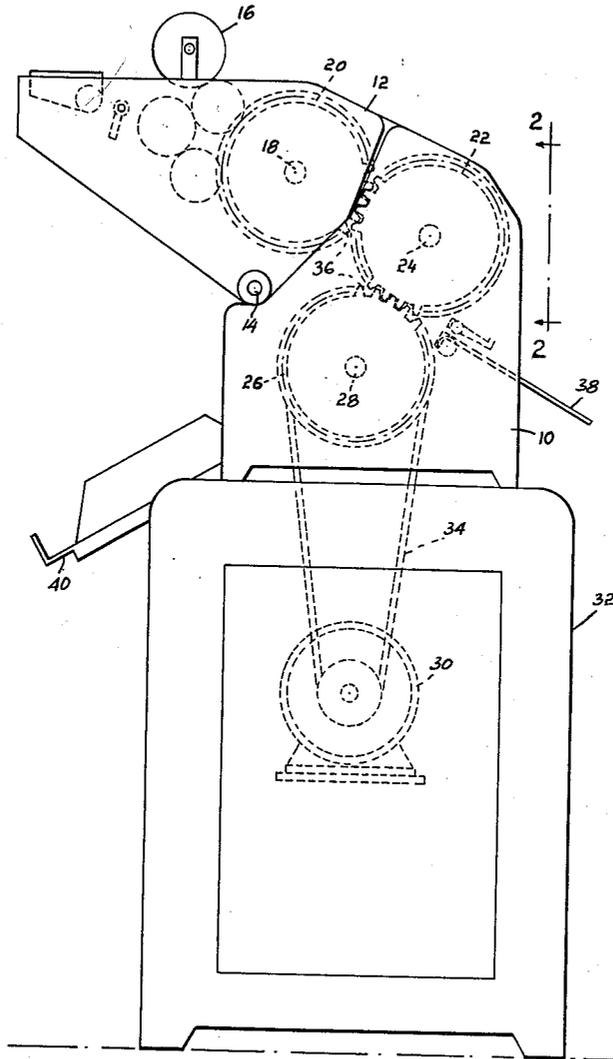


Fig.-7

INVENTOR.
EDWARD J. JANKE
BY

Bates, Tonne & McBean
ATTORNEYS

March 8, 1960

E. J. JANKE

2,927,528

CODE PRINTING MACHINE

Filed Sept. 23, 1957

5 Sheets-Sheet 3

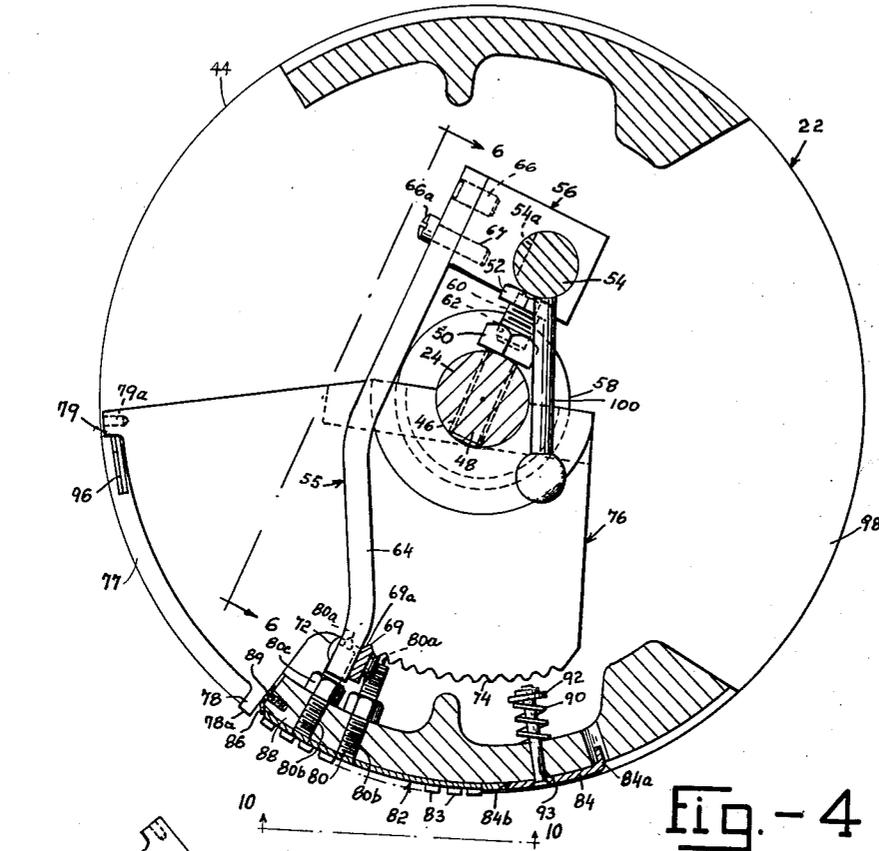


Fig. - 4

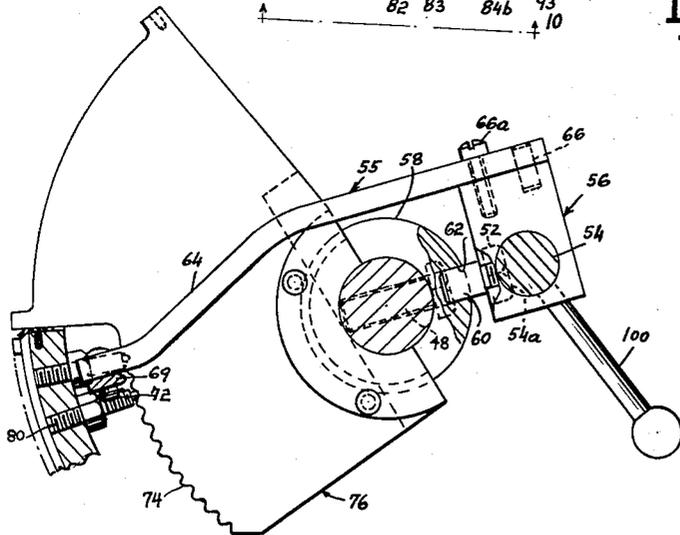


Fig. - 5

INVENTOR.
EDWARD J. JANKE
BY

Bates, Teare & McBurn
ATTORNEYS

March 8, 1960

E. J. JANKE

2,927,528

CODE PRINTING MACHINE

Filed Sept. 23, 1957

5 Sheets-Sheet 4

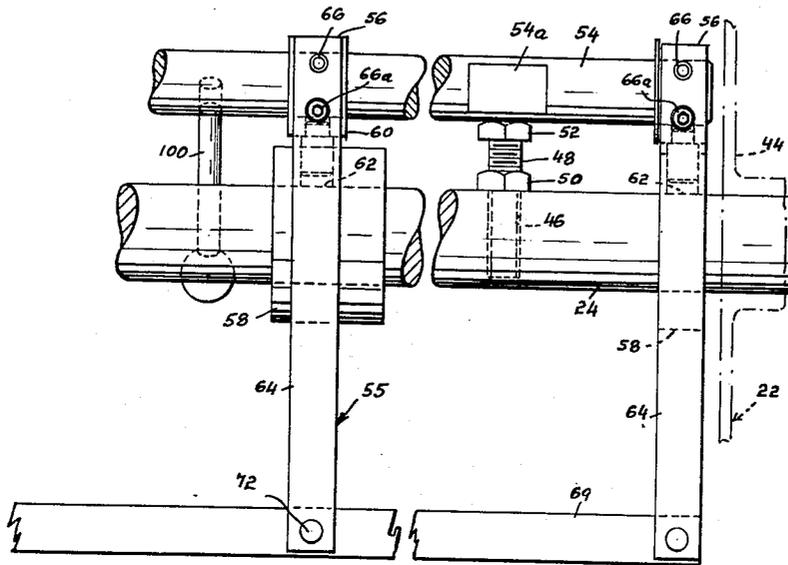


Fig. - 6

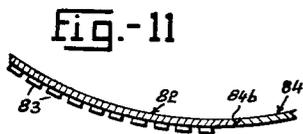


Fig. - 11

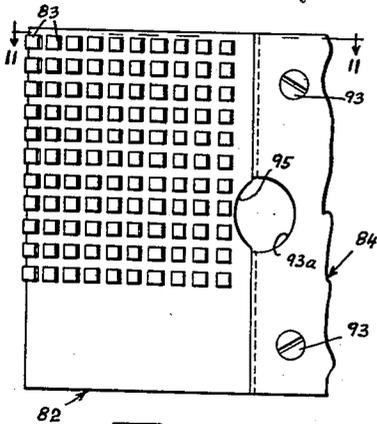


Fig. - 10

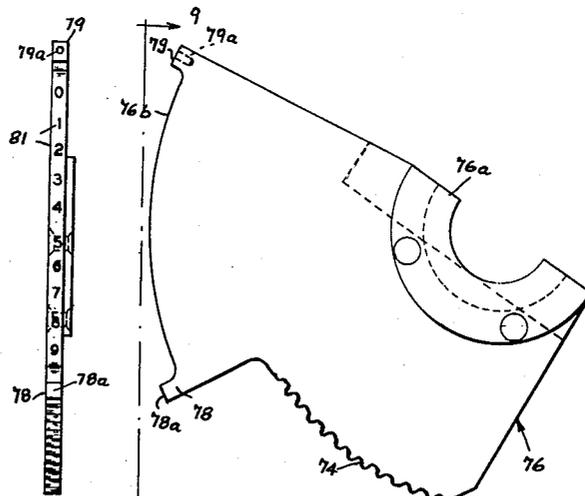


Fig. - 9

Fig. - 8

INVENTOR.
EDWARD J. JANKE
BY

Bates, Teare & M^cBeau
ATTORNEYS

March 8, 1960

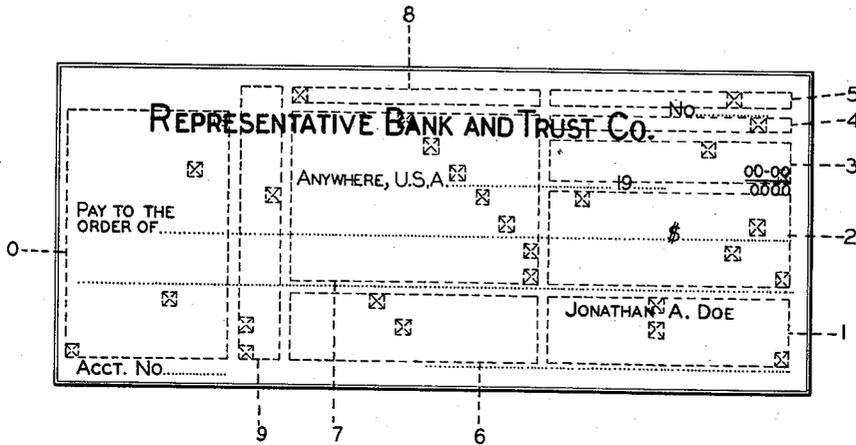
E. J. JANKE

2,927,528

CODE PRINTING MACHINE

Filed Sept. 23, 1957

5 Sheets-Sheet 5



CODE:

- | | |
|------------------------------|------------------------|
| 1 - CITY, STATE OR TERRITORY | 6 - BANK BRANCH NUMBER |
| 2 - BANK NUMBER | 7 - ACCOUNT NUMBER |
| 3 - FEDERAL RESERVE DISTRICT | 8 - COMMAND |
| 4 - FEDERAL RESERVE BRANCH | 9 - COMMAND |
| 5 - AVAILABILITY OF FUNDS | 0 - BANK AMOUNT |

Fig-12

INVENTOR.

EDWARD J. JANKE

BY

Bates, Teare & McBean
ATTORNEYS

1

2,927,528

CODE PRINTING MACHINE

Edward J. Janke, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio, a corporation of Delaware

Application September 23, 1957, Serial No. 685,660

14 Claims. (Cl. 101—91)

This invention relates to printing machines and more particularly to a novel arrangement of printing machine which is operable to deposit or print data representing means at selected points on a record member such as a card, check or other document, for indicating data on such documents. Such indicating data or code can then be used, among other purposes, to verify the basic format of the printed document and/or to automatically process the document, using for instance conventional record controlled apparatus. The data representing means may either be of the visible kind or of the invisible kind, or a combination of both, and may be composed of any material capable of being sensed by suitable processing personnel or equipment.

The printing machine embodying the invention is particularly useful in printing indicating data in codified form on checks or the like, in which the basic format of the check has been previously printed in the conventional manner. In addition, in the latter use, the data representing means is preferably comprised of material of the kind essentially invisible to the naked eye, but which becomes active or visible when subjected to the proper type of sensing medium, such as a predetermined wave length of radiation. It will be apparent that such indicating data on documents such as checks, would not only provide means for authenticating portions of the information in the printed format of the check, but also if suitably arranged, may be used in combination with conventional sensing apparatus to automatically reproduce such data, translate the latter, or otherwise handle or process the check or document itself.

The present invention provides a printing machine unit for printing indicating data and/or a code on checks or the like and wherein such data may be effectively and efficiently printed at minimum cost. In accordance with the invention, the latter described printing machine unit may comprise an inking mechanism including a master inking cylinder for supplying ink for printing, an imprinting cylinder having a plurality of code impression segments mounted therein by means of a novel clamping arrangement, and adapted to imprint data representing means in a predetermined pattern or code, and an impression cylinder adapted to coat with the imprinting cylinder to transfer the ink, data representing material from the code segments to a worksheet, such as a check, passed between the bite of the imprinting and impression cylinders. The printing machine unit of the invention is particularly adapted for use in series with a conventional offset printing machine unit, which prints in conventional visible ink, the basic format of the worksheet or check, including such information as name of the drawee bank, the name of the drawer, etc., after which the check is passed through the printing machine unit of the invention, wherein the data representing means is printed in codified form on the check, with relatively invisible ink. The check or worksheet may then be passed through other units in series with the latter described units for performing other operations on the worksheet, such as perforat-

2

ing the check body or punching the latter in a manner well known to those skilled in the art.

The printing unit of the invention thereby provides an arrangement that can be conveniently used in combination with conventional printing or other operational machines, thereby providing a code printing mechanism without the necessity of altering or otherwise redesigning existing printing equipment.

Accordingly the primary object of the invention is to provide a printing machine unit which can be effectively and efficiently used to imprint data representing means in code or other forms on a document, such as a check in which the format or body of the document or check has been previously printed in the conventional manner.

Another object of the invention is to provide a printing machine unit of the aforementioned type and wherein such data representing means when imprinted on the worksheet or document is comparatively invisible to the naked eye, but which becomes active or visible when subjected to the proper actuating media such as a predetermined type of radiation.

A further object of the invention is to provide a printing machine unit which will effectively and efficiently imprint data representing means in codified form or otherwise, on a previously printed worksheet, such as a check, and wherein such unit may be expeditiously used in series with other units which perform, in a systematic manner, conventional working operations on the associated worksheet or check, to provide a continuous automatic operation and without the necessity of altering or redesigning such conventional units.

A more specific object of the invention is to provide a code printing machine unit comprising a master inking cylinder, a code imprinting cylinder having detachable code segments mounted therein by means of an operable latch or clamping mechanism, and an impression cylinder coacting with the code cylinder to transfer the ink, data representing material to the worksheet, when the latter is passed between the bite of the code and impression cylinders.

Another object of the invention is to provide a printing machine unit having a printing cylinder which comprises a plurality of movable or adjustable printing segments or slugs mounted therein for imprinting data representing means in codified form on a document or other worksheet, such as a check or the like, and wherein a novel clamping mechanism is provided on the printing cylinder for clamping or locking the printing surfaces of the printing slugs in a predetermined pattern or systematic arrangement by means of a wedge bar coacting in wedging engagement with the printing slugs, to move the latter into tight, non-movable abutment against a shaft extending through the axis of rotation of the printing cylinder, but wherein the clamping mechanism may be quickly and easily moved to unlocking or inoperative position whereby the pattern arrangement of the printing slugs may be quickly and efficiently changed to conform to changing data on the format of subsequently fed worksheets.

Other features and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

Fig. 1 is a side elevational view of a printing machine unit embodying the invention;

Fig. 2 is a transverse, partially sectioned, elevational view of the imprinting or code cylinder taken generally along line 2—2 of Fig. 1 and illustrating the lever actuated latching mechanism for clamping the code imprinting segments or slugs to the cylinder proper, a number of the printing slugs having been removed to better illustrate the invention;

Fig. 3 is a view generally similar to Fig. 2, but with the

3

cylinder rotated upwardly into the plane of the paper, to show the other side thereof;

Fig. 4 is an enlarged, vertical sectional view taken generally along lines 4—4 of Fig. 3, looking in the direction of the arrows, and illustrating the clamping mechanism for the code segments in locked or operative position;

Fig. 5 is an enlarged, fragmentary, vertical sectional view showing the latter mentioned clamping mechanism in unlocked or inoperative position;

Fig. 6 is an enlarged, fragmentary view, taken generally along line 6—6 of Fig. 4, of the clamping mechanism for locking the printing slugs or segments in a predetermined pattern on the printing cylinder, and illustrates the structural arrangement for mounting the clamping mechanism on the support or bearing shaft of the cylinder;

Fig. 7 is an enlarged, sectional view of one of the spring loaded plunger assemblies which are mounted in the printing cylinder and are adapted to engage notched portions of the printing slugs to maintain the latter in assembled relationship with the printing cylinder when the clamping mechanism is in unlocked or inoperative position.

Fig. 8 is an enlarged, side elevational view of one of the printing segments or slugs of the printing machine unit of the invention, such segment or slug being adapted to imprint data representing means in a pattern or codified form on a worksheet and being adapted to be adjustable or movably mounted in or on the printing cylinder to provide means for quickly changing the pattern arrangement of the printing slugs in accordance with changing data on the printed format of the worksheet;

Fig. 9 is an end elevational view taken generally along line 9—9 of Fig. 8 looking in the direction of the arrows;

Fig. 10 is a fragmentary, bottom plan view taken generally along line 10—10 of Fig. 4, looking in the direction of the arrows, and illustrating other of the printing slugs or "electros" of the printing unit of the invention, and its associated holding or clamping plate device for holding the "electro" in assembled, operative position on the printing cylinder, the latter printing slugs or electros being non-adjustable and thus being adapted to print data of a comparatively permanent nature, in codified form, on a worksheet;

Fig. 11 is a vertical sectional view taken generally along 11—11 of Fig. 10;

Fig. 12 illustrates a worksheet or check on which code markings (shown in phantom lines as X'd squares) have been printed in selected groupings or areas, by the apparatus of the invention, together with an explanation of what such coded areas may represent.

Referring to the drawings, the printing machine comprises a pair of generally vertically extending side frame members 10, spaced apart by suitable cross frame members (not shown). A supplementary frame 12 is pivoted to the main side frame 10 as at 14, and carries an inking system 15 thereon. Inking system 16 may be of any conventional type, such as is shown and described in the U.S. Patent No. 1,968,849, issued August 7, 1934, to Lawrence H. Morse, or U.S. Patent No. 2,065,535, issued December 29, 1936, to the same inventor. Accordingly the inking system will not be described herein in detail.

Supplementary frame 12 also carries a rotatable shaft 18 on which is mounted a master inking cylinder 20 which coacts with the inking train rollers of inking system 16 to furnish ink for the printing operation. Cylinder 20 has a rubberized blanket or surface so arranged as to transfer the ink from the inking train of system 16 to the imprinting segments or slugs mounted on the printing or code cylinder 22 in the optimum manner. In this connection the rubber blanket or surface of cylinder 20 may be so cut as to supply ink only to the areas of

4

imprinting on printing cylinder 22. The ink as afore-described is preferably of the type that is substantially invisible to the naked eye, but which becomes visible to selected processing personnel or equipment after being subjected to the proper actuating medium. An example of a suitable ink for the instant purposes would be one containing fluorescent materials which would be substantially invisible under ordinary light, but which would glow and become visible when subjected to a different wave length of light, as for instance ultraviolet light.

Printing or code cylinder 22 is rotatably journaled on side frame 10 by means of cross shaft 24. Also rotatably carried on the side frames and below code cylinder 22, is an impression or platen cylinder 26, mounted on shaft 28. Suitable adjustments may be provided to align the axes of the above-mentioned cylinders with respect to one another, to permit regulation or adjustment of the distances therebetween, in a manner well known to those skilled in the art.

In the embodiment of the invention shown, the printing mechanism is driven by an electric motor 30 mounted in the base cabinet 32 and drivingly connected to the impression cylinder 26 by driving elements, such as belt 34. The master inking cylinder 20, the printing or code cylinder 22, and the impression cylinder 26 are provided with interengaging gearing 36 so that each cylinder will be driven in synchronism with the other.

The impression cylinder 26 is preferably equipped with suitable worksheet receiving or clamping mechanism to insure passage of the worksheet between the bite of the impression and printing cylinders. Likewise, a suitable worksheet ejector or stripping mechanism may be provided to insure discharge of the worksheet from the bite of such cylinders after the worksheet has passed therebetween. Suitable mechanism for such purposes are illustrated and described in detail in U.S. Patent No. 1,968,849 heretofore mentioned.

At the proper time in the cycle of revolution of the impression cylinder 26, and in accordance with suitable timing devices (not shown), the worksheet, such as a sheet of checks on which the formats of the checks have been previously printed in the conventional manner, is fed on work table 38 into the bite of the impression and printing cylinders. The aforementioned sheet receiving mechanism on impression cylinder 26 clamps the leading edge of the worksheet, and the latter is progressed between the cylinders 22 and 26, at which time the data representing means or code is imprinted on the worksheet. The worksheets may be either fed manually or by automatic mechanism, such as a series of moving tapes, into the bite of the impression and printing cylinders. After being imprinted with the code, the worksheet is stripped from the impression cylinder by the aforementioned ejector or stripper mechanism and is received in tray portion 40 of the machine. It will be understood, of course, that if the printing unit illustrated is placed in series with other worksheet processing units in the manner discussed in the initial portion of this specification, the worksheet is preferably moved automatically to the bite of cylinders 24 and 26, the code is imprinted thereon, and then the worksheet is automatically carried to the next operating apparatus in the series, such as by means of moving tapes, for further processing.

The printing or code cylinder 22, comprises a generally hollow, cylindrical body portion 42 secured to shaft 24, a plurality of code imprinting segments or slugs 76 adjustably or movably mounted on shaft 24 in body portion 42, a series of spring loaded plungers or resilient detents 80 for maintaining the printing slugs 76 in assembled condition in the cylinder, a clamping mechanism 55 mounted on cylinder shaft 24 and including a wedge bar 69 adapted for wedging coaction with the printing slugs 76 to lock the latter in a predetermined pattern arrangement on the cylinder, and a series of spaced window

plates 96 removably mounted on the body portion 42 for use in visually indexing the printing slugs 76 into said predetermined pattern arrangement when the clamping mechanism 55 is in unlocked or inoperative position. The generally hollow, cylindrical-like body portion 42 has end walls 44 which carry the aforementioned shaft member 24. Spaced transversely along shaft 24 intermediate end walls 44 are a series of tapped openings 46 into which abutment projections such as bolt or screw members 48 are threaded. Lock nuts 50 maintain members 48 in a predetermined axial position with respect to the associated tapped receiving opening 46. Each of elements 48 comprises a head portion 52 which is adapted for engagement with locking or supplementary shaft member 54 of the aforementioned clamping mechanism 55.

Clamping mechanism 55, in the embodiment of the invention illustrated, broadly comprises the above-mentioned shaft 54, housing or bearing blocks 56 having projecting means 60 for mounting the clamping mechanism 55 on cylinder shaft 24 for generally radial movement with respect to the shaft 24, arm elements 64, which support the aforementioned wedge bar 69, and a handle or lever element 100 for manual rotation of supplementary shaft 54 with respect to the housing blocks 56.

Shaft 54, which is generally cylindrical in vertical cross section, has a series of flats or planar sections or surfaces 54a spaced transversely therealong in generally aligned relationship with the axes of the aforementioned tapped openings 46 in the cylinder or main shaft 24. These planar sections 54a are adapted for unlocking the clamping mechanism as will hereinafter be discussed in more detail. Shaft 54 is rotatably mounted in a series of the aforementioned transversely spaced housing or bearing blocks 56. Blocks 56 are disposed in generally confronting relationship to cylindrical like collar portions 58 on cylinder shaft 54. A boss or cylindrical lug 60 extends inwardly toward the axis of shaft 24 from each of housing blocks 56 and is received in telescoping relationship in a complementary confronting recess or opening 62 in each of the collar portions 58.

An arm 64 is mounted on each of the housing blocks 56 and projects therefrom toward the outer periphery of cylinder 22. Arms 64 are attached to blocks 56 by any suitable means, and in the embodiment of the invention shown such means comprises a stud 66 (Fig. 4) projecting outwardly from block 56 into a complementary opening in the inner end of arm 64, and a threaded member, such as a bolt or screw 66a threadedly engaged in tapped hole 67 in the block member 56.

The outer or free ends of arms 64 are connected to the aforementioned, transversely extending wedge bar member 69, as by means of fastening elements 72. Bar 69 has a wedge surface 69a thereon, which faces toward the cylinder shaft 24 and the supplementary shaft 54, substantially in line with the axes of these shafts (Fig. 4). Wedge bar 69 is adapted to engage a serrated or notched portion 74 on each of code or data printing segments 76, and clamp the latter in the printing cylinder 22.

Printing segments 76 are of generally flat, segmental like or quadrantal configuration (Figs. 8 and 9), having a collar portion 76a which is adapted for engagement with cylinder shaft 24, a segmental code printing and indexing portion 76b, and the aforementioned serrated or notched abutment portion 74. Printing and indexing portion 76b extends radially outwardly further than does toothed portion 74, and comprises at opposite extremities thereof, outwardly projecting lug portions 78 and 79. Lug portion 78 has a code or data printing surface 78a thereon which extends through a window or opening 77 cut into the periphery of the cylinder wall. Surface 78a, in the embodiment of the invention illustrated, would print a generally square mark on the worksheet or document, but it will be understood of course that the print-

ing surface of slugs 76 could be arranged to imprint any configuration of identifying mark on the associated worksheet. Lug portion 79 has a recess 79a therein which is adapted to receive a pointed tool or like instrument for manually rotating or moving the segments 76 about shaft 24 to change the pattern arrangement of the printing surfaces 78a of printing slugs 76 to conform to changes in the printed data on the format of the worksheet (i.e. in the case of checks, changes in bank branch numbers, account numbers, commands, etc., see Fig. 12). Lug portion 78 extends radially outwardly from the axis of cylinder shaft 24 a greater distance than does lug 79, thereby insuring that only the printing surface 78a on lug 78 will engage the worksheet during printing operations.

Intermediate the lug portions 78 and 79 are provided identifying media 81, such as the Arabic numbers illustrated in Fig. 9, which are for use in properly positioning or indexing the printing surfaces 78a of the code segments into a predetermined pattern, for printing data representing means in the aforesaid codified form on a worksheet.

A plurality of spring loaded studs or plungers 80 are mounted on cylinder wall 88 of cylinder 22 (Figs. 3 and 4) and extend inwardly toward the axis of the cylinder to engage the notched portions 74 of code segments 76, to retain the latter in assembled condition with shaft 24 of the cylinder, when the clamping mechanism is moved to unlocked position. Stud 80 comprise a spring loaded plunger member 80a (Fig. 7) disposed in a peripherally threaded body portion 80b which is threaded into trapped openings in the cylinder wall as best illustrated in Figs. 4 and 5. Lock nuts 80c (Figs. 4 and 5) maintain studs 80 in a predetermined inwardly extending position with respect to wall portion 88. It will be seen that studs 80 maintain the code segments 76 in assembled position in cylinder 22 and releasably hold the printing segments during indexing of the latter to change the pattern arrangement of printing surfaces 78a on the code segments in accordance with changes in the printed information on the format of the worksheet, while clamping mechanism 55 is adapted to positively lock the code segments 76 in a predetermined pattern arrangement to insure against inadvertent movement of the code segments about shaft 24 during the printing operations and resultant rotation of cylinder 22.

Studs 80 are staggered in two rows (see Fig. 3) along the cylinder wall 88 of the cylinder, in the interests of adequate space for the size of stud used, and for maintaining the strength of wall 88 in the vicinity of these studs. The studs 80 are so disposed on wall portion 88 that the axes of the studs lie in planes which pass substantially through the axis of cylinder shaft 24.

In the embodiment of the invention shown, eleven of the code segments 76 are adapted to be mounted in each of the window openings 77 in the cylinder walls (Fig. 3) and thus three documents, such as three checks, in the form of a single worksheet can be code imprinted at the same time, with each printing revolution of the cylinder. It will be understood of course that the invention is not limited to imprinting code on only three documents but may be used to imprint a single or any number of documents, the only limitation being the transverse width of the cylinder 22 and associated number of printing slugs 76.

Plate-like code segments or slugs 82 (Figs. 4 and 10), commonly known as electros, are also mounted on the periphery of cylinder 22, generally adjacent openings 77 therein. Each of slugs 82 has a plurality of printing surfaces 83 thereon and are adapted to imprint generally permanent information in code form on the worksheet. In the case of printing checks, such permanent information might include such data as the bank identification, the city, the State, the Federal Reserve District, etc. Segments 82 are mounted in assembled position on cylinder 22 by means of spring loaded locking plates 84, in com-

bination with shoulder plates 86 (Fig. 4), suitably attached to an end of wall portion 88 of the cylinder, as by means of screw members 89. Locking plate 84, on one end thereof, has a flange portion 84a which is received in an opening in wall 88 of the cylinder 22, and on the other end thereof has a beveled surface 84b (Fig. 11) adapted for holding engagement with a complementary beveled surface on the confronting end of code segment 82, to hold the latter in an assembled condition on the cylinder 22. Locking plate 84 is spring loaded, as aforesaid, by spring 90 disposed between the inner surface of cylinder wall portion 88 and an abutment 92 (Fig. 4) on the inner end of stud 93 about which spring 90 is coiled. A notched or recessed portion 93a is provided on one edge of each of locking plates 84 and in superimposed relationship to an opening in wall 88 of the cylinder to provide means for inserting a tool, such as a hook, for readily moving locking plate 84 outwardly against the resistance to compression of the springs 90, and thereby permit release of code printing slug 82. The confronting edge of printing slug 82 is also provided with a notched portion 95 complementary to notched portion 93a in the locking plate 84 to aid in the release of slugs 82. Since the data representing code printed by segments or slugs 82 is of a permanent, generally unchanging nature, these segments can be used and then be filed away for future use in printing a batch of work sheets, such as checks, requiring the identical information thereon.

Extending across window openings 77 in the code cylinder 22, and attached to the cylinder walls are indexing plates 96 (Figs. 2 and 4), which have a series of transversely spaced windows or openings 96a therein, for use in visually setting or indexing the code segments 76 in a predetermined pattern, in accordance with the Arabic figures 81, or other identifying media, stamped or otherwise marked on code segments 76. Indexing plates 96, in combination with the aforementioned shoulder plates 86 (Fig. 4), limit the extent of permissible pivotable movement of code segment 76 about cylinder shaft 24. An opening 98 (Figs. 3 and 4) is provided in the cylinder wall on the side generally opposite to openings 77 therein, to permit easy access to the interior of the cylinder for locking and unlocking the clamping mechanism 55.

Operation of the mechanism to change the pattern of the code imprinting segments 76 is as follows: As best shown in Fig. 4, the handle or lever 100 projects from locking or auxiliary shaft 54 and in the position illustrated in the latter figure is in locking position. In this position the head 52 of threaded elements 48 engages in abutting, holding relationship with the generally arcuate, peripheral portions of shaft 54, thereby pulling or moving the wedge bar 69 into wedging coaction with the notched portion 74 of each of the code segments 76. The code segments 76 are thus held or locked against relative rotational movement with respect to the cylinder shaft 24. Worksheets are passed between the bite of printing and impression cylinders 22 and 26, whereupon the code printing surface 78a on code segments 76 print, in a predetermined pattern and preferably in substantially invisible ink, the desired data on the format of the printed worksheet. The worksheet is then stripped from the impression cylinder and is deposited in tray 40 on the printing unit, or is progressed to other operational machines for further processing. The printing cylinder 22 may be provided with bearing rings 102 (Figs. 2 and 3), disposed intermediate the code printing areas of the cylinder, which will aid in carrying the worksheets through the printing position. Since the code printing cylinder prints from metal type, it will be preferable to provide a resilient or rubberized surface on the impression cylinder to oppose the metal code segments on the printing cylinder, to thereby insure better transference of the ink from the printing surfaces 78a and 83 on the code printing segments 76 and 82.

When it is desired to change the code pattern being printed by the printing surfaces 78a on code segments 76, the handle 100 of clamping mechanism 55 is moved to the position illustrated in Fig. 5 of the drawings, thereby rotating the locking or supplementary shaft 54 and presenting the flat or planar surfaces 54a on the shaft in confronting relationship to head portions 52 of elements 48. The latter position of the parts permits the supplementary shaft to move radially inwardly toward cylinder shaft 24 thus releasing the tension on arm elements 64 and permitting the wedged bar 69 to be released from wedging coaction with the notched portions 74 of the code segments 76 as shown in Fig. 5. The latter segments can then be pivoted with respect to shaft 24 to set a new or different code pattern using the aforementioned windows 96a in indexing plates 96 to align the positioning indicating media 81 on the code segments with the respective window in plates 96 in accordance with a predetermined plan. The latter can be most conveniently and efficiently accomplished by inserting a pointed tool or instrument, as aforesaid, in the recess 79a in each of lugs 79 on code segment 76, and moving the desired one of the position indicating media 81 into underlying relationship with the corresponding window 96a in the indexing plate 96. Spring loaded studs 80 permit such movement or rotation of the code segments 76, while holding the segments in assembled condition with the cylinder. It will be apparent that without studs 80, the segments might fall away from assembled coaction with the cylinder shaft 24 and jam in the cylinder when the clamping mechanism 55 is in unlocked position.

After the code segments 76 are reset into the desired pattern and in the manner described above, the handle or lever 100 is moved back to the position illustrated in Fig. 4 of the drawings, thereby rotating shaft 54 and moving the arcuate portions of the shaft into abutting relationship with the head portions 52 of bolt elements 48, whereby the shaft 54 and associated bearing blocks 56 are moved radially away from shaft 24 and arms 64 on the clamping mechanism are tensioned to thus pull or urge wedge bar 69 into wedging coaction with the notched or toothed portions 74 of segments 76, to lock the code printing surfaces 78a of the segments in a predetermined pattern arrangement. Movement of lever 100 to locking position is limited by engagement with the cylinder shaft 24. It will be seen that projections or studs 60 on each of the housing or bearing blocks 56 maintain the clamping mechanism in assembled condition with the cylinder, by extending sufficiently forwardly into openings 62 in collar portions 58 on cylinder shaft 54, to prevent withdrawal thereof from openings 62 even when locking shaft 54 is in unlocking position.

The printing segments 76 may be easily inserted into assembled condition with the cylinder, or removed therefrom, by merely unlocking the clamping mechanism 55 in the manner aforesaid, removing the indexing plates 96 and drawing the segments through windows 77 or inserting the segments into windows 77 as the case may be, against the resistance to compression of spring loaded studs 80. The latter represents an important feature of the invention in that the segments 76 may be easily and efficiently changed or replaced with minimum effort and by relatively unskilled labor.

Code segments 83 which imprint data representing means of a generally permanent nature may be easily changed by grasping locking plates 84 through notched portion 93a thereof and lifting up on the plate, to thereby permit removal of code elements 82 from engagement with shoulder plates 86 and the beveled end 84b of locking plate 84.

From the foregoing description and accompanying drawings it will be seen that the invention provides a printing machine unit which can effectively and efficiently print data representing means in codified form on a worksheet or document and at a minimum cost. Such unit, includes

means whereby the pattern of the code may be easily and quickly changed to correspond to changing printed data on the format of the documents. Moreover, the printing unit of the invention provides an arrangement, whereby data representing means of a generally permanent nature can be printed on the document and in coded form together with the printing of the changeable data, and wherein novel clamping arrangements or mechanisms are provided to maintain the printing elements of the apparatus in locked or operative condition, but which can be easily moved to unlocked or inoperative position, to permit changing of the pattern of the code imprinting means.

The terms and expressions which have been employed are used as terms of description and not of limitation and there is no intention in the use of such terms and expressions of excluding any equivalents of the features shown and described or portions thereof but it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a machine of the type described for printing data representing means in codified form on a document containing printed information, a generally hollow printing cylinder including an axially extending shaft to which said cylinder is attached, printing slugs mounted in said cylinder for imprinting said means on said document in a predetermined pattern arrangement, means for movably mounting said slugs in said cylinder for permitting changing of said pattern arrangement in accordance with changes in the information printed on the format of the document, said mounting means comprising a segmental collar portion on each of said slugs and adapted for engagement with said shaft, means for locking said slugs in a predetermined pattern arrangement, said locking means coacting between said shaft and an outer portion of each of said slugs to clamp the latter against relative rotational movement with respect to said shaft, and means for moving said slugs to change the pattern arrangement thereof when said locking means is moved to unlocking position.

2. In a printing machine in accordance with claim 1 wherein said locking means comprises bearing blocks mounted on said shaft for generally radial movement with respect to the latter, a supplementary shaft rotatably mounted in said bearing blocks and extending in a direction generally parallel to said cylinder shaft, a wedge bar connected to said bearing blocks, and means on said cylinder and supplementary shafts for urging the latter apart, whereby said wedge bar is moved into wedging coaction with said outer portions of said slugs to clamp the latter into abutting engagement with said cylinder shaft.

3. In a printing machine in accordance with claim 2 wherein said bearing blocks are mounted on said cylinder shaft by means of dowels attached to said blocks and received in telescoping relationship in complementary openings in said cylinder shaft.

4. In a printing machine in accordance with claim 2 wherein said outer portion of each of said slugs is notched for receiving in wedging coaction therewith said wedge bar.

5. A rotary type printing machine unit for imprinting data representing means in codified form on worksheets which contain printed information on the formats of the worksheets, comprising a frame, a generally hollow printing cylinder including a lengthwise extending shaft, rotatably mounted on said frame, code imprinting slugs mounted on said shaft and adapted for printing said means on said worksheets in a predetermined pattern arrangement, an inking cylinder adapted to coact with the printing surfaces of said slugs to transfer ink to said surfaces for printing said means on said worksheets, means for movably mounting said slugs on said shaft whereby said pattern arrangement of the printing surfaces of said slugs can be changed in accordance with changing information on said worksheets, means for locking said

slugs in said predetermined pattern arrangement, said last mentioned means coacting between an outer portion of each of said slugs and said shaft to clamp said slugs against said shaft, and an impression cylinder adapted to coact with said printing cylinder to draw the worksheets between the impression and printing cylinders for imprinting said data representing means on the worksheets.

6. In a printing machine in accordance with claim 5 wherein spring loaded means are mounted on said printing cylinder and resiliently engage said slugs to hold the latter in assembled relationship with said printing cylinder when said locking means is in unlocking position.

7. A clamping device for securing printing slugs of the type described on a generally hollow printing cylinder having an axially extending shaft to which the cylinder is attached, said device comprising a plurality of bearing blocks mounted on said shaft and adapted for radial movement with respect thereto, a locking shaft rotatably mounted in said blocks, a wedge bar connected to said bearing blocks and extending generally parallel to said shafts, said wedge bar being adapted for wedging coaction with said printing slugs to urge the latter into abutting engagement with said first-mentioned shaft, said first-mentioned shaft being disposed generally intermediate said second-mentioned shaft and said wedge bar, and means on said shafts to move the bearing blocks and associated locking shaft away from said cylinder shaft in said direction, upon predetermined rotation of said locking shaft to locking position.

8. A clamping device in accordance with claim 7 wherein said bearing blocks are mounted on said cylinder shaft by means of dowels secured to the bearing blocks and received in telescoping relationship in complementary openings in said cylinder shaft.

9. A clamping device in accordance with claim 7 wherein said wedge bar is secured to said bearing blocks by a plurality of outwardly extending arms secured to said blocks.

10. A clamping device in accordance with claim 7 wherein said wedge bar is disposed in a plane passing generally through the axes of said shafts.

11. In a clamping device in accordance with claim 7 wherein said locking shaft is of generally circular configuration in vertical cross-section, said means comprising a plurality of projections on said cylinder shaft adapted for abutting engagement with the generally arcuate periphery of said locking shaft, said locking shaft including planar surfaces thereon adapted for confronting relationship with said projections to permit said wedge bar to move out of wedging coaction with said printing slugs.

12. A detachable printing slug for a printing machine of the type described, said slug being of generally plate-like quadrantal configuration and comprising an inner segmental collar portion of arcuate-like configuration for rotatably mounting the slug on a shaft of an associated printing cylinder, said slug having an outer printing surface on the radial periphery thereof adapted to imprint data representing means on a worksheet and an abutment portion spaced inwardly in a radial-direction and circumferentially from said printing surface for engagement with associated clamping means to detachably secure said slug to said printing cylinder.

13. A printing slug in accordance with claim 12 wherein said abutment portion is notched, said slug including means for manually rotating the slug with respect to the shaft of the associated printing cylinder when the clamping means is in deactivated position.

14. In a printing machine in accordance with claim 5, including other printing slugs mounted on said printing cylinder for printing data representing means in codified form on worksheets in accordance with information of a generally permanent nature imprinted on said worksheets, said other of said slugs being of generally arcuate-like shape in vertical cross-section and being adapted to be mounted on a peripheral wall of said printing cylinder,

11

and means for clamping said other printing slugs on said printing cylinder, said last mentioned means comprising a spring loaded plate having a bevelled end surface adapted for holding engagement with a complementary opposing surface on one end of the associated of said other printing slugs.

References Cited in the file of this patent

UNITED STATES PATENTS

1,738,422 Corse ----- Dec. 3, 1929 10

1,798,328

1,991,511

2,069,656

2,152,204

2,300,575

2,582,187

2,660,111

2,796,828

12

Kohler ----- Mar. 31, 1931

Lyman ----- Feb. 19, 1935

Kohler ----- Feb. 2, 1937

Moore ----- Mar. 28, 1939

Johnson ----- Nov. 3, 1942

Wolowitz ----- Jan. 8, 1952

Herrick ----- Nov. 24, 1953

Ritzerfeld ----- June 25, 1957