June 17, 1969 C. P. KUEVER 3,450,040

ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINE

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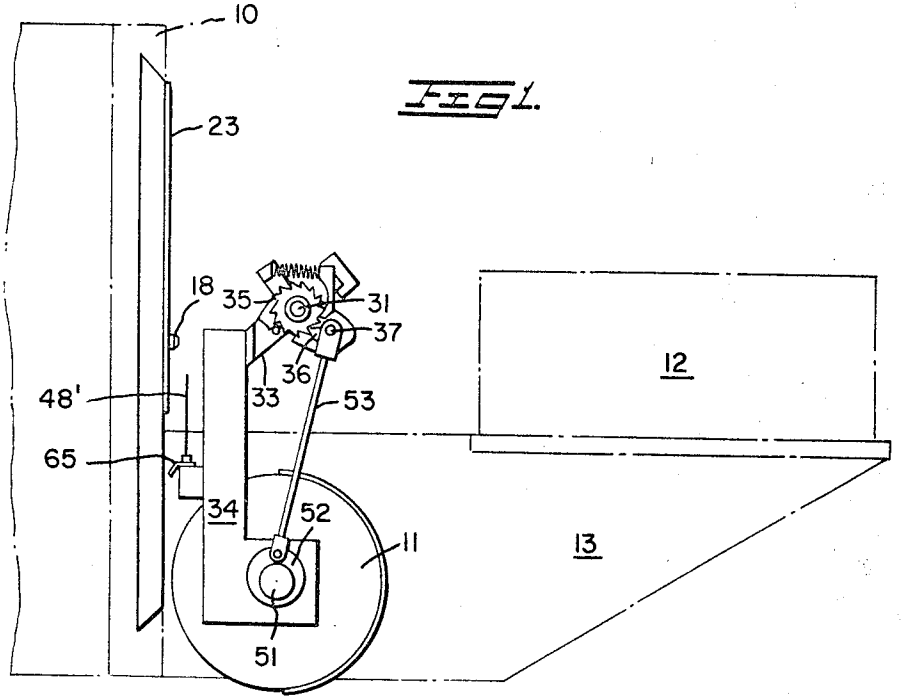


Fig 1.

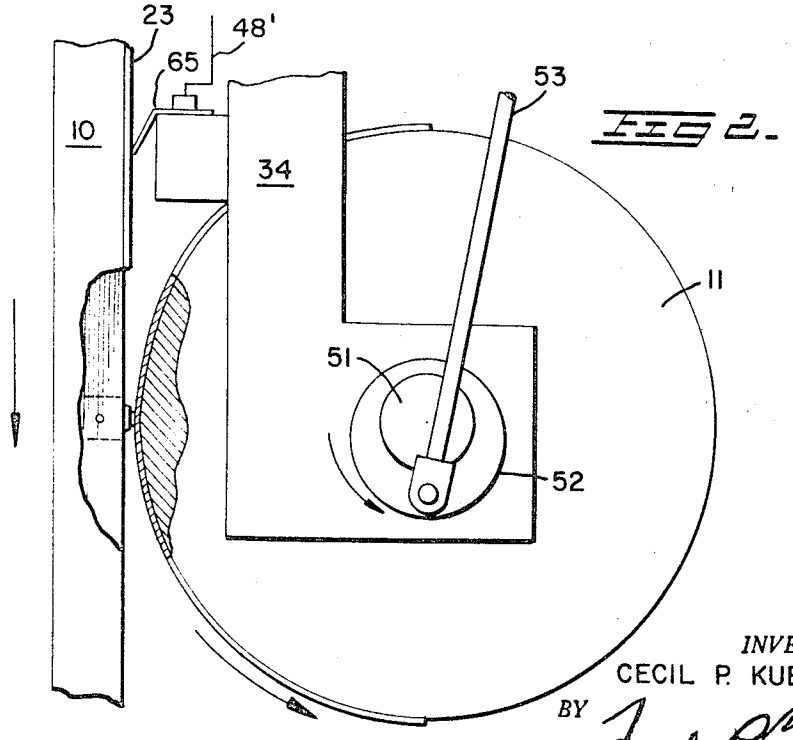


Fig 2.

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ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINES

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Fig 3.

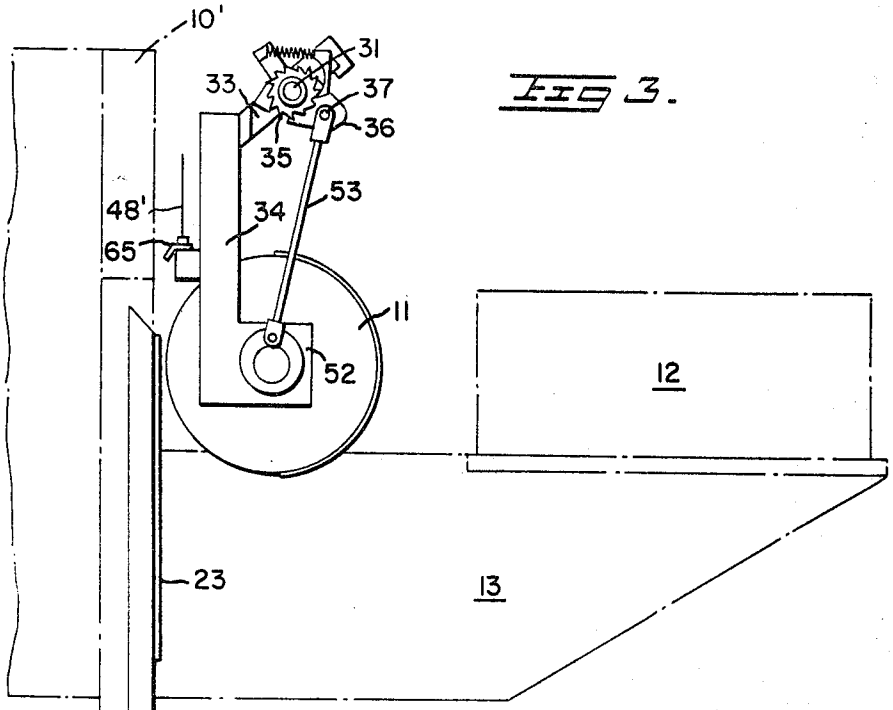
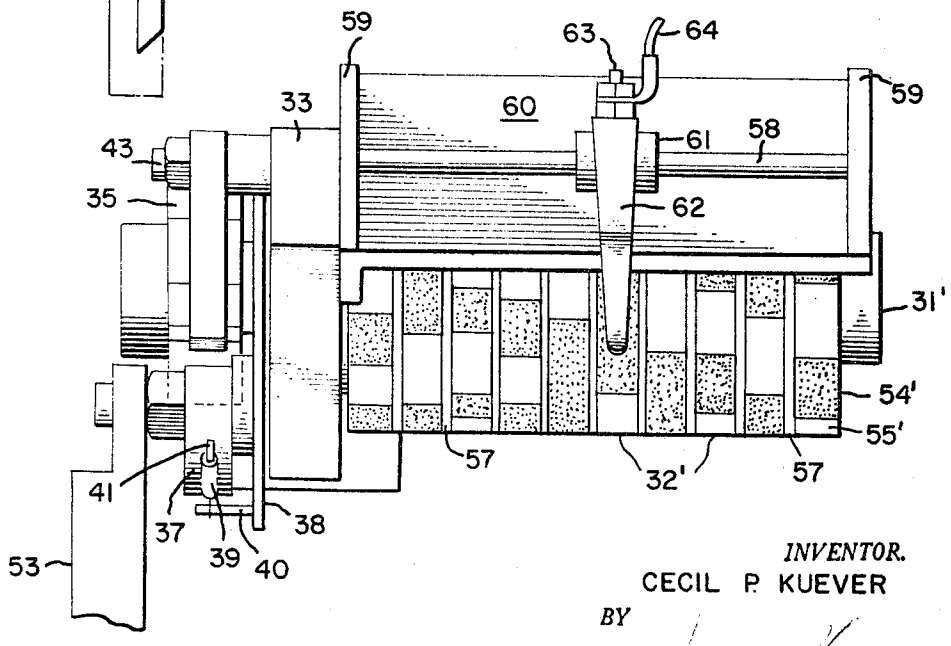


Fig 12



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ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINES

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Fig 4.

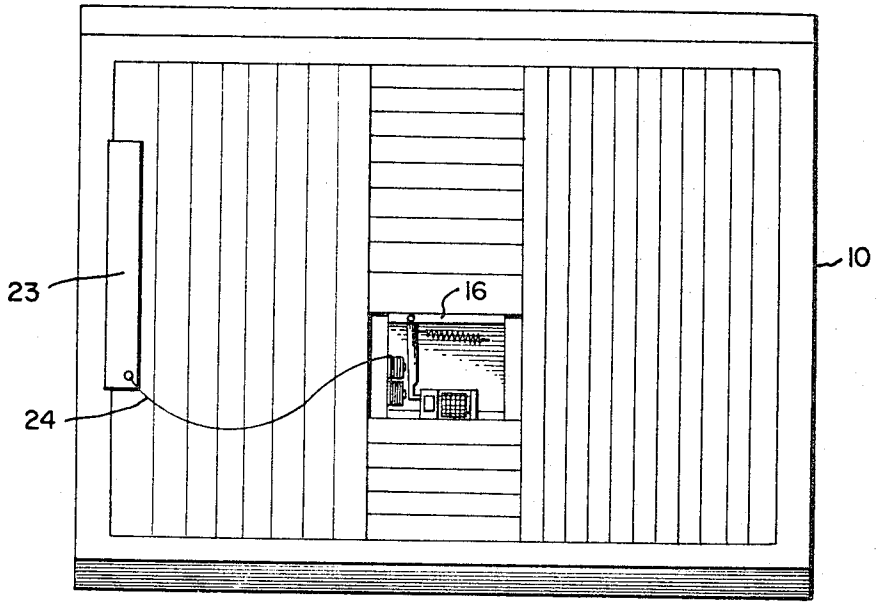
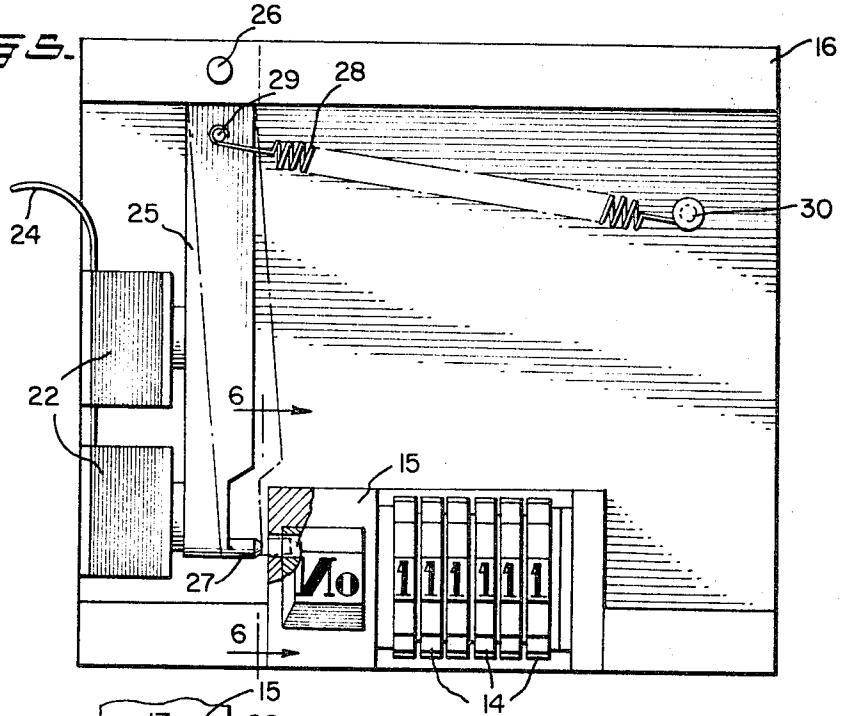


Fig 5.



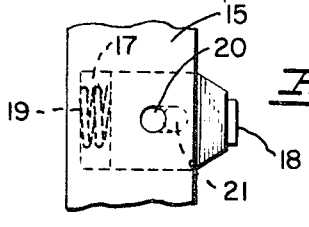


Fig 6.

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ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINES

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Fig 7.

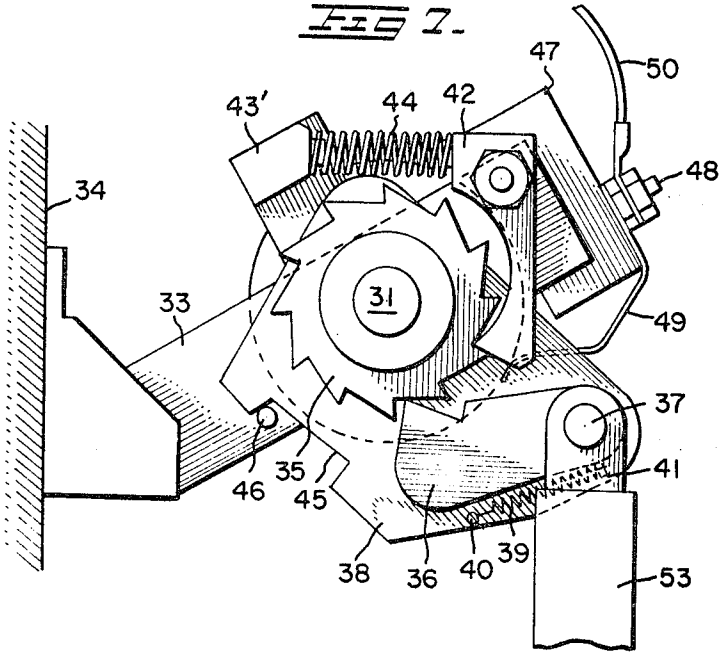
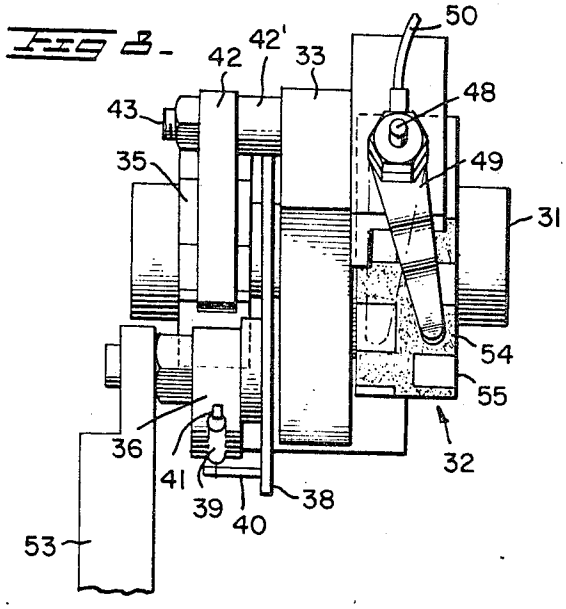


Fig 8.



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ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINES

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Fig 9.

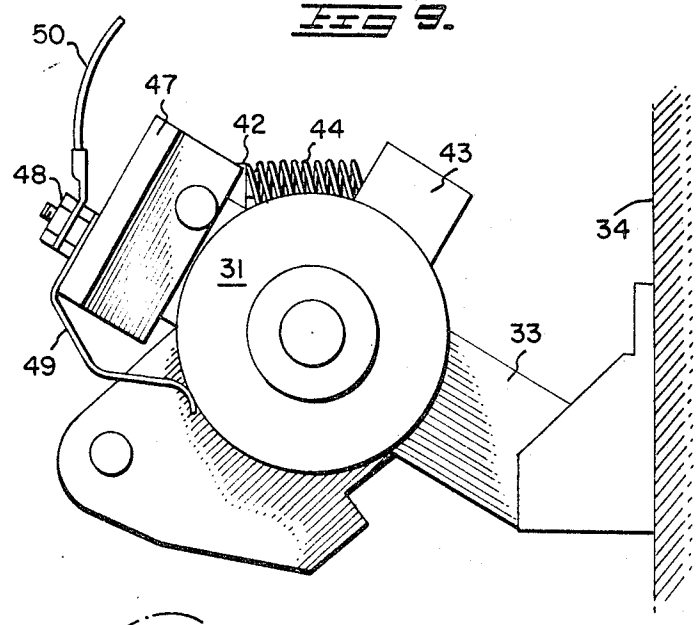
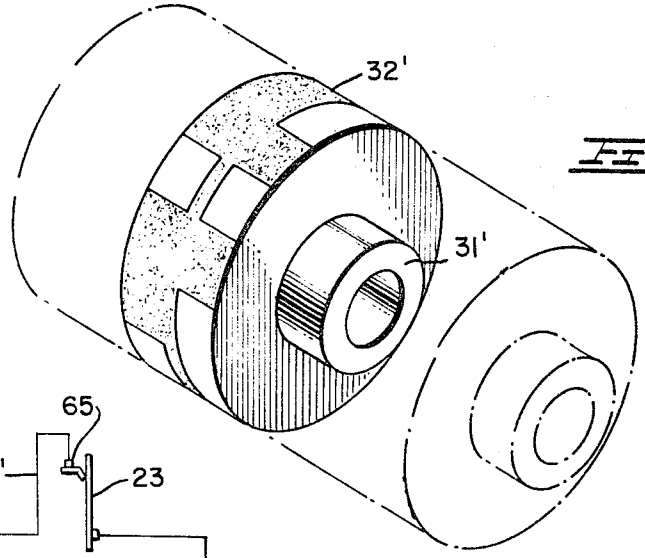


Fig 10.



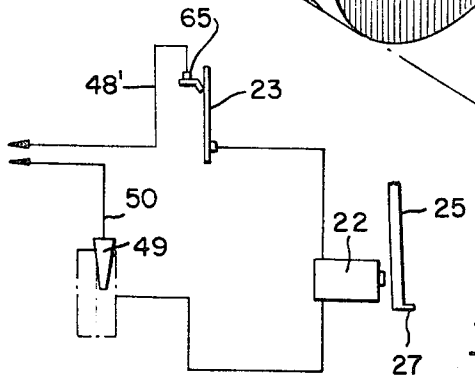


Fig 11.

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United States Patent Office 3,450,040
Patented June 17, 1969

3,450,040

ELECTRICALLY OPERATED NUMBERING DEVICE IN BED AND CYLINDER PRINTING MACHINES

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Filed Mar. 6, 1967, Ser. No. 620,788
Int. Cl. B41l 45/00; B41f 3/58; B41j
U.S. Cl. 101—88 4 Claims

ABSTRACT OF THE DISCLOSURE

A numbering arrangement for a printing press whereby a conventional numbering machine of the type which includes a set of rotatable discs with indicia mounted on the periphery of the discs are adapted to imprint a number on a printing surface, such as a business form or the like. The rotatable discs with indicia thereon can be made to imprint numbers on a printing surface consecutively or to repeat the same number on a plurality of forms. The sequence of the numbers to be imprinted is made responsive to a programmed sequence control which is in electrical communication with the rotatable discs.

BACKGROUND OF THE INVENTION

Numbering mechanisms have previously been employed in association with printing presses. Such numbering mechanisms are adapted to imprint an identifying number or other indicia on a letter or sheet or form and usually, if the indicia are in the form of numbers the numbers are usually applied to such forms or letters in series, that is, the printing may start off with number one (1) being applied to the first form and the number increasing in increments of one number as each form is printed. Often times it is desirable to repeat the same identifying number or indicia to a plurality of forms. The present invention is designed to provide for a simple yet effective manner in which such repeat imprinting of the same identifying indicia can be made responsive to a pre-coded programmer control. Thus, once the programmer control has been pre-arranged by a press operator, the numbering of the sheets or forms will become automatic without further attendance thereto by a press operator and the forms or sheets as they are imprinted will contain the desired indicia thereon.

SUMMARY OF THE INVENTION

The present invention is shown in association with a "Miehle" type vertical press, although it should be pointed out that the structure of the present numbering arrangement of indicia on a printing surface can be adapted to a variety of types of printing press. For instance, in the printing of business forms, it is often desirable to have the forms consecutively numbered starting with one number and increasing the number by one increment with each successive form until the entire lot has been printed. When consecutive numbers are applied to a form, the set of discs having number indicia on the periphery thereof, are caused to present the next successive number on the next form to be printed. This is usually accomplished through some mechanism which is actuated either by the vertical movement of the imprinting cylinder of the press or by the vertical movement of the type bed with which it is associated. Thus, as the imprinting cylinder and/or type bed are caused to move relative to one another, the actuating mechanism for the number discs which is in association therewith will cause the numbering discs to be advanced to the next successive number so that the next number will be imprinted on the next printed form. However, there are instances

when it is desirable to have the same number appear on a plurality of successive printed forms. The present invention combines a conventional set of numbering discs with an electrically controlled stop member which is made responsive to a programmed sequence control which will determine and automatically control the number of times a given numbering indicia are applied to a plurality of successive printed forms.

The main object of the invention is to provide an automatic means whereby the sequence of numbering indicia to be applied to a printing surface is made responsive to an electrical control in the form of a cylinder which has been pre-coded with electrical and non-electrical contact areas so that a contact arm riding thereon will through suitable electrical control means, effect the change in the numbers applied by the indicia bearing discs.

Another object of the invention is to provide for an automtic numbering mechanism which can be adapted to a conventional printing press without greatly modifying the structure of the existing printing press with which it is to be associated.

Another object of the present invention is to provide for an automatic numbering mechanism for a printing press which is made responsive to an electrically controlled sequence device which is capable of a large number of variations so that the frequency of repeat of the same number indicia applied to a plurality of printing surfaces may be electrically controlled.

Another object of the invention is to provide for a simple manner in which the sequence of operation of the indicia carrying numbering discs can be controlled by a movable contact arm in electrical contact with a pre-coded electrical contact area.

Another object of the invention is to provide an electrical contact surface in the form of a plurality of pre-coded wheel structures which are mounted for rotation on a shaft which derives its rotational movements from a connection existing between the impression cylinder of the press and a ratchet wheel associated with the aforementioned shaft and wheel structures.

Other objects and advantages of the invention will be apparent from this specification and its accompanying drawings wherein the invention is explained by way of example only.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a schematic side elevational view of the invention as applied to a Miehle type press;

FIGURE 2 is an enlarged fragmentary detailed view partially broken away to show the press in a partially actuated position;

FIGURE 3 is a view similar to FIGURE 1 showing the press in its extreme actuated position;

FIGURE 4 is a front elevational view of a portion of the present invention as applied to the type bed;

FIGURE 5 is an enlarged front elevational view of the device shown in FIGURE 4;

FIGURE 6 is an enlarged fragmental sectional view taken along the lines 6—6 of FIGURE 5 looking in the direction of the arrows;

FIGURE 7 is a side elevational view of a portion of the programming device of the present invention;

FIGURE 8 is a front elevational view of the device shown in FIGURE 7;

FIGURE 9 is a side elevational view of the programming device as viewed from the opposite side of that shown in FIGURE 7;

FIGURE 10 is a perspective view of the programmer roll of the present invention;

FIGURE 11 is a wiring diagram of the various components of the present invention; and,

FIGURE 12 is a front elevational view of a modified form of the programming device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the drawings, there is shown in FIGURE 1 thereof only so much of a Miehle vertical press of well-known construction as is deemed necessary to disclose the adaptation of the present invention to a press of this type. Such presses comprise a type bed **10** mounted for vertical reciprocatory movement in a way frame and an impression cylinder **11** mounted on a suitable cylinder frame for vertical reciprocatory movement in opposition to that of the type bed. In one direction of vertical reciprocation the impression cylinder is rotated to imprint a sheet, gripped thereby against a type form set up on the type bed.

A stock supply **12** may comprise blanks which will be imprinted by the press and simultaneously thereto an identifying indicia in the form of numbers are applied thereto. In the case where the blanks are already imprinted, then the numbering device of the instant invention may be employed for the numbering of the blanks in a manner to be more fully described hereinafter. A suitable support **13** supports the stock supply **12** in sheet delivery position in any known manner.

The numbering device of the present invention comprises a set of rotatable discs **14** formed of any suitable material with raised printing surfaces formed on the periphery of said discs.

The rotatable discs are mounted for rotation in a housing **15** which is positioned in a framework **16**. A recess **17** is formed in one end of housing **15** and a spring pressed contact surface **18** is adapted to reciprocate within said recess **17**. A spring **19** normally urges the contact surface **18** outwardly of the recess **17**. A pin **20** is provided on the spring pressed contact **18** and slides within a slot **21** formed in the wall of the housing **15** when the press is in operation. Thus it will be seen that the slot **21** in housing **15** will permit for the inward movement of the spring pressed contact member **18** within the recess **17** but will prevent the complete withdrawal thereof from within the recess.

The discs **14** may bear indicia on their peripheries such as numbers from 0 to 9, for example, and as many discs may be employed as is necessary to apply the required number indicia. All of the discs are mounted for rotation on a common shaft (not shown), and the discs are adapted to be rotated in a step-by-step movement by means of a ratchet and pawl mechanism (not shown). The numbering discs, aforesaid, are of known construction. Essentially, the spring pressed contact surface **18** is adapted to normally extend beyond the plane surface of the type bed and as the type bed and impression cylinder are each reciprocated in opposite directions during the printing operation, as aforesaid, the impression cylinder forces the contact member **18** within the recess **17** against the action of spring **19**. Each time the contact member is forced inwardly of the recess, as aforesaid, a disc is caused to rotate a suitable increment so as to present for imprinting on a sheet or form, the next successive number. Thus, it will be seen that each time the type bed **10** and impression cylinder **11** are caused to reciprocate during operation of the press, the numbering discs will present consecutive numbers to be imprinted on the sheet or stock.

The present invention provides for an effective manner whereby the discs **14** of the numbering mechanism may be made to respond to a programmed sequence of operation thereby enabling a press operator to print the same indicia over and over again on successive forms, stock or sheets. This is accomplished in a manner to be more fully described hereinafter.

Referring now to FIGURE 5 of the drawings, there is shown therein a pair of solenoids **22** which are suitably mounted within the framework **16**. The solenoids **22** are in electrical connection with a contact plate **23** as by a conductor wire **24**. The plate **23** is secured in any manner to the type bed **10**. Mounted within the framework **16** is a locking lever **25** pivoted as at **26** to the framework **16**. The lever **25** is provided at the lower end thereof with a locking pin **27** which is adapted to engage in the slot **21** and to prevent the return of the spring pressed contact **18** outwardly from within the recess **17** when it is desired to print the same indicia on a plurality of successive forms. A spring **28** is secured to the lever **25** as at **29** and the other end of the spring is suitably anchored as at **30** to the framework **16**.

During operation of the press, when it is desired to print consecutive numbers or indicia on sheets or forms to be imprinted, the solenoids are energized in a manner to be described hereinafter and the locking lever **25** and pin **27** are in the position shown in full lines in FIGURE 5 of the drawings with the pin **27** out of engagement with the slot **21**. Thus, as the type bed **10** and impression cylinder **11** are reciprocated, as aforesaid, the spring pressed contact **18** is caused to be forced rearwardly into recess **17** and through the ratchet and pawl mechanism (not shown), the next consecutive number of the disc is caused to be brought to imprinting position so as to imprint on the sheet or stock the next consecutive number. However, there are times when it is desired to repeat the same identifying number or indicia on successive forms or sheets being imprinted and the programming device of the present invention provides for an efficient manner in which this can be automatically accomplished.

The programmer of the present invention comprises a rotatable shaft **31** upon which is adapted to be keyed or otherwise secured thereto an electro-conductive wheel or disc **32** shown more clearly at FIGURE 8 of the drawings. Shaft **31** is mounted for rotation on a bracket **33** which is suitably secured to an L-shaped arm **34** which is fixed for reciprocation with the impression cylinder **11**. Shaft **31** has keyed thereto a ratchet wheel **35** which is adapted to receive a pivoted pawl **36** for imparting a step-by-step rotational movement to the ratchet wheel **35**, shaft **31** to which it is keyed and the electro-conductive wheel or disc **32** also keyed to the aforementioned shaft **31**. Pawl **36** is pivoted as at **37** to a plate-like member **38** which is rotatably mounted on shaft **31**. A spring **39** normally urges the pawl **36** is sliding contact with the ratchet wheel **35**. Spring **39** is anchored at one end to a pin **40** on plate **38** and the other end thereof is secured to a securing means **41** on the pawl **36**. Thus, it will be seen that the spring **39** normally urges the pawl to be at all times in sliding contact with the ratchet wheel **35**.

A second pawl **42** is pivotally mounted on shaft **43** which is fixed to bracket **33**. A spacer **42'** extends between pawl **42** and bracket **33**. An abutment **43'** is fixed to the bracket **33** and a spring **44** is interposed between the abutment and pawl **42** to force said pawl in engagement with the ratchet wheel **35** so as to prevent any backward rotational movement thereof. A cut-out portion **45** is formed on plate **38** and a stop member **46** is provided on bracket **33** so as to limit the rotational movement of the ratchet wheel and its associated parts when the press is in operation in the numbering of sheets or forms with the desired indicia.

A generally U-shaped bracket **47** is fixed to bracket **33** as shown more clearly in FIGURES 7 and 9 of the drawings. Bracket **47** is formed of a non-conductive material such as plastic and has fixed thereto in any manner an electrical terminal post **48**. A sliding electrical contact spring bar **49** is secured to the terminal post **48** and extends over the conductive wheels or discs **32** for a purpose to be more fully described hereinafter. A conductive wire **50** leads from terminal post **48** to a suitable source of electrical power.

The ratchet **35**, shaft **31** and electro-conductive wheels or discs **32** are caused to be rotated in a step-by-step movement in the following manner,

Shaft 51 which mounts the impression cylinder 11 has secured thereto an eccentric 52. Rod 53 is journaled in any manner to the eccentric 52 and the other end thereof is pivotally secured to shaft 37 as best shown in FIGURE 7 of the drawings.

Thus, it will be seen that as the impression cylinder reciprocates during operation of the press, the rod 53 in its downward and upwards travel will cause the plate 38 to which it is pivotally secured to a like movement and since the pawl 36 is also connected to the plate member 38, the ratchet 35 will be rotated in a step-by-step rotational movement.

Shown in FIGURE 8 of the drawings is a single electro-conductive wheel or disc 32. The wheel or disc may be made of any electro-conductive material and is provided with non-electrical areas 54 which can be formed on the wheel in any known manner. Thus, the wheel or disc 32 is provided with electro-conductive areas 55 and non-electrical conductive areas 54.

Referring now to FIGURE 12 of the drawings, there is shown therein a modified form of a programmer wherein a plurality of wheels or discs 32' are each keyed for rotation with shaft 31'.

The wheels or discs 32' are made of any suitable electro-conductive materials and formed thereon at selected areas are non-electrical conductive areas 56. Numeral 55' denotes electro-conductive areas. The non-electrical conductive areas 54' may be formed on the wheels or discs 32' in any known manner. Each wheel or disc 32' is separated from each other by means of a suitable insulation shown at 57. The modification shown in FIGURE 12 of the drawings includes a rod 58 which is mounted between a pair of brackets 59 and an intermediate plate 60 is secured to the brackets in any suitable manner. A slide bushing 61 formed of a suitable non-electrical conductive material is mounted for sliding adjustment along the rod 58. A spring contact arm 62 of electrical conductive material is secured in any manner to a terminal post 63. A conductor wire 64 extends from post 63 and connects with a suitable source of power. An electrical contact arm 65 is secured in any manner to the L-shaped arm 34. As shown in FIGURES 1 and 2. Contact arm 65 is adapted to engage with the contact plate 23 which is mounted on the type bed 10. A conductor wire 48' leads to a suitable source of power. The programmer shown in FIGURE 12 of the drawings is intended to operate in the same manner as previously described with respect to FIGURES 7 and 8 of the drawings. However, it will be noted that in the form of the invention shown in FIGURE 12 of the drawings, there is provided a plurality of wheels or discs 32' so as to enable the programmer to a greater versatility in the application of identifying indicia to letters, forms, etc.

FIGURE 10 of the drawings discloses the manner in which a plurality of wheels or discs 32' may be applied to a common shaft 31'. As can be appreciated, any number of wheels or discs may be applied to the common shaft as is deemed necessary in the performance of application of identifying indicia to printed matter. Suitable insulation is applied between the wheels in any known manner.

The wheels or discs 32 and 32' are formed of a suitable electro-conductive material and there is formed on the peripheries thereof in any manner, non-electrical areas for a purpose to be more fully described hereinafter.

FIGURE 11 of the drawings discloses a simple wiring diagram which can be employed with the structure of the present invention.

Having described in detail the various components of the present invention, the manner of operation thereof will now be set out more in detail.

Assuming that it is desired to print the forms with successively numbered indicia, the forms will be fed to the machine, one by one, and as the print is applied thereto the contact bar 49 is caused to travel on the periphery of a wheel which has no non-electrical areas thereon. Thus, the contact bar in its contact with a fully electrically conductive wheel will complete the circuit between the contact bar 49 and solenoids 22, thus energizing the solenoids 22 which will pull the lever 25 and pin 27 rearwardly to the position shown in full lines in FIGURE 5 of the drawings. With the lever and pin in this position, each time the type bed and impression cylinder are reciprocated, as aforesaid, during the printing operation, the spring pressed contact 18 is depressed by the impression cylinder and the next consecutive number on the discs 14 is caused to be brought to a printing position in the manner set forth previously. The printing of consecutive numbers on successive forms will continue until such time as the contact bar is caused to travel over a wheel which has segments thereon of non-electrical conductivity, whereupon the circuit between the contact bar and solenoids will be broken and the locking bar 25 and pin 27 through spring 28 will be caused to move to the position shown in dotted lines in FIGURE 5 when the pin 27 will engage with the slot 21 thus locking the numbering mechanism with the result that during the further reciprocation of the type bed and impression cylinder during the printing operation the spring pressed contact 18 having been locked and prevented from further reciprocal movement, the means associated therewith to turn the discs so as to present a new number are rendered inactive and the same number is presented by the discs 14 to be printed on the forms until such time as when the contact bar 49 is caused to contact with an electro-conductive area on the wheel when the circuit between the contact bar 49 and solenoids 22 will be re-established to energize the solenoids. As can be appreciated, when the contact arm of bar 49 encounters a non-conductive area on the periphery of the wheel or disc, the circuit to the solenoids 22 is broken and the spring 28 now forces the locking pin 27 into slot 21 of the housing 15. This prevents the spring pressed contact 18 from full retraction from within the recess 17. Thus, upon the next reciprocal movement of the bed and impression cylinder, no contact is made by the impression cylinder with the spring pressed contact and the same number or other identifying indicia as appeared on the wheel or disc on the next preceding printing operation remain the same and this same number or indicia will appear on successive forms or stock to be imprinted and this will continue for successive forms or stock until such time as the contact bar or arm 49 contacts an electro-conductive area on the wheel or disc 32 whereupon the electrical circuit to the solenoids is closed and the locking lever 25 and pin 27 assume the position shown in full lines in FIGURE 5 of the drawings.

Thus, it will be seen that by a simple arrangement of pre-coded wheels or discs having electrical and non-electrical areas strategically placed on the peripheries thereof, and arranging such wheels or discs on a common shaft in the manner aforesaid, any number of various type number applying schemes may be devised to operate on a completely automatic basis.

As can be appreciated from FIGURE 12 of the drawings, a number of pre-coded wheels or discs, as aforesaid, are all arranged on a common shaft for rotation therewith. Thus, by the mere adjustment of the contact arm 62 by sliding the bushing 61 along bar 58, differently coded wheels or discs may be contacted so as to vary the sequence of print of the identifying numbers or indicia carried by the rotatable discs 14.

With the structure shown in FIGURE 8 of the drawings, the contact bar 49 may be swung on its pivot at post 48 to ride on different wheels as shown in dotted lines.

While I have disclosed the invention as adapted particularly to a Miehle type press, it is obvious that the same may be efficiently applied to other type printing presses which is provided with any means capable of imparting a

step-by-step rotation of the wheels or discs which have been pre-coded with electrical and non-electrical areas and which are mounted on a common shaft for rotation therewith.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed is:

1. In a numbering attachment for a reciprocating type press including an impression cylinder and type bed, said numbering attachment comprising a plurality of numbering wheels and means to cause said numbering wheels to rotate in a step by step movement to present consecutive numbers to be applied to a surface to bear an imprint thereon, the improvement comprising, a pre-coded wheel mounted for reciprocating movement with said cylinder and adapted to be rotated in a step by step movement upon each reciprocal movement of said cylinder and type bed, said pre-coded wheel comprising electrical and non-electrical conducting areas on the surface thereof, an electro-conductive plate mounted on said type bed and adapted to reciprocate therewith, a contact arm reciprocating with said reciprocating cylinder and adapted to engage with said electro-conductive plate, an electro-conductive arm engaging with said pre-coded wheel a solenoid operated locking lever associated with said numbering attachment whereby when said electro-conductive arm is in contact with a non-electrical conducting area on said wheel, said locking lever engages with said numbering attachment and prevents the rotation of the wheels therein to thereby cause the repeated printing of the same number on said surface.

2. The structure recited in claim **1** whereby when said electro-conductive arm is in contact with an electrical conducting area on said wheel, said locking lever is retracted from its locking position and the numbering wheels advanced in a step by step movement to present consecutive numbers to be printed on said surface.

3. The structure recited in claim **1** wherein said pre-coded wheel comprises a plurality of wheel structures mounted on a common shaft and each having pre-coded electrical and non-electrical areas formed on the peripheries thereof.

4. The structure recited in claim **1** wherein said electrical contact arm is capable of being shifted across the surface area of said wheel structures for engagement with selected wheel structures.

References Cited

UNITED STATES PATENTS

976,295	11/1910	Reinhardt	101—80
1,021,466	3/1912	Kuen	101—88
1,500,424	7/1924	Smith	101—77
2,404,912	7/1946	Krouse	101—88
2,526,004	10/1950	Carothers et al.	101—80
2,556,251	6/1951	Bell	101—250
2,652,772	9/1953	Katz	101—72
2,900,898	8/1959	Buttner	101—283 X
2,922,363	1/1960	Dudley	101—282

WILLIAM B. PENN, *Primary Examiner.*

U.S. Cl. X.R.

101—80, 282