Nov. 12, 1940. G. H. HIGGINS ET AL 2,220,903

PRINTING MACHINE

Filed Dec. 28, 1937 3 Sheets-Sheet 1

Fig. 1.

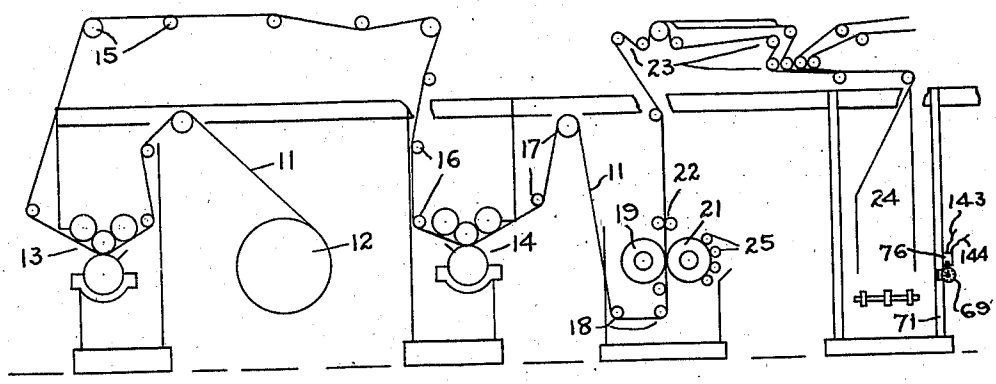


Fig. 2.

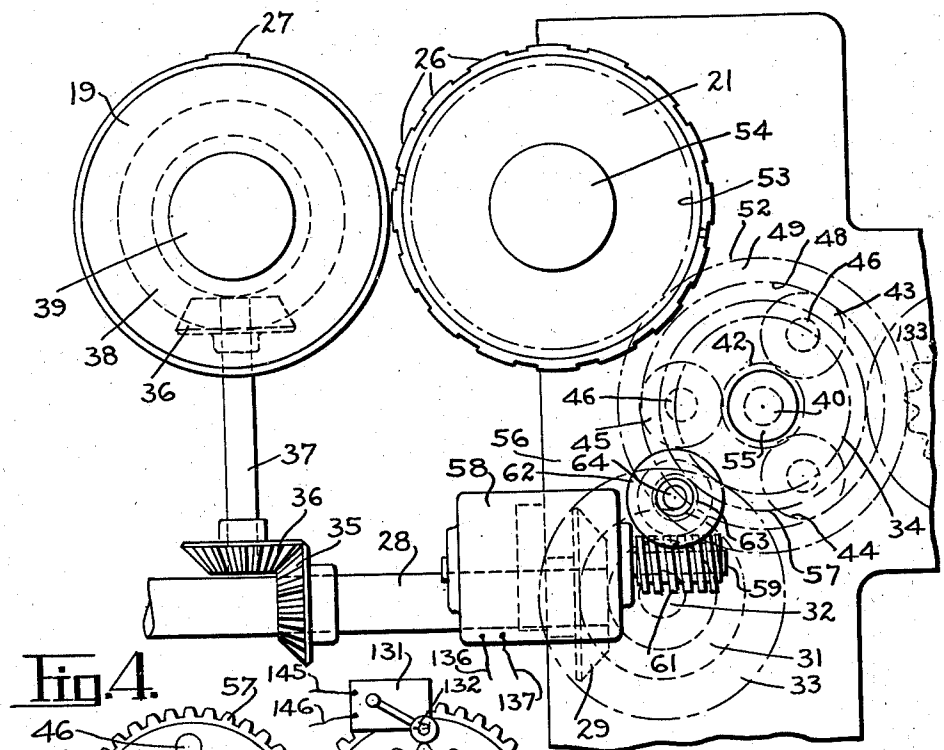
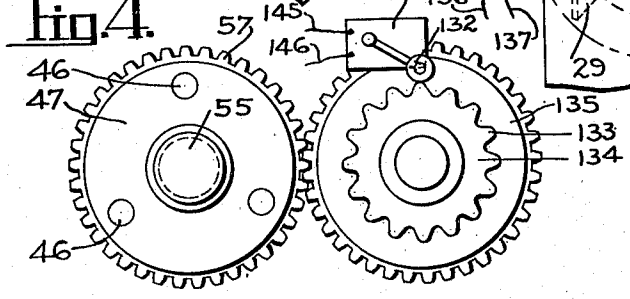


Fig. 4.



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Fig. 3.

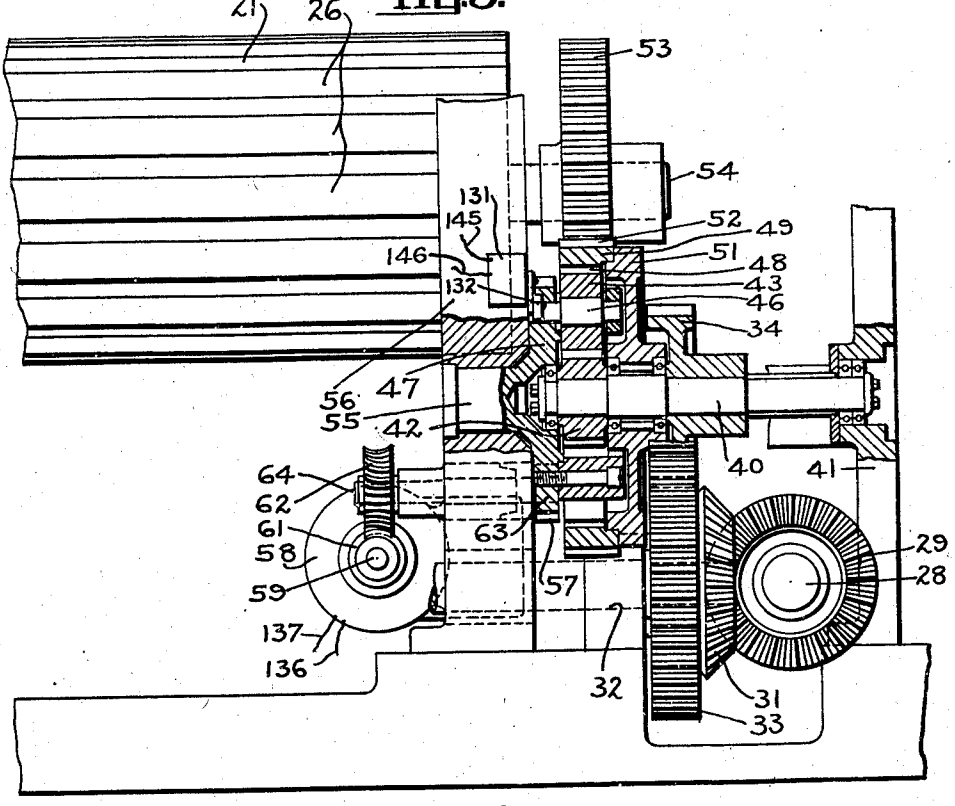
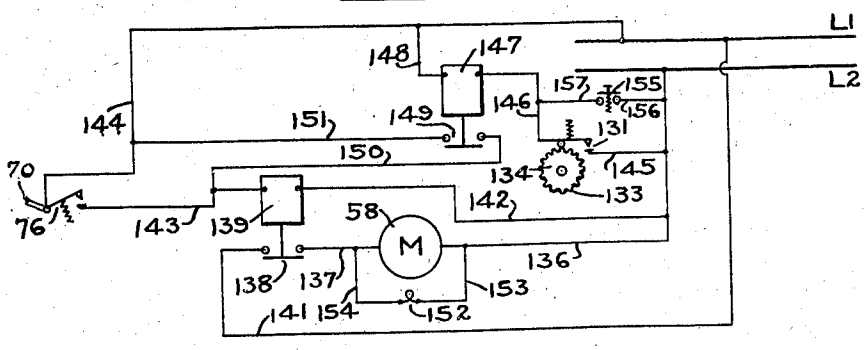


Fig. 9.



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PRINTING MACHINE

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Fig.5.

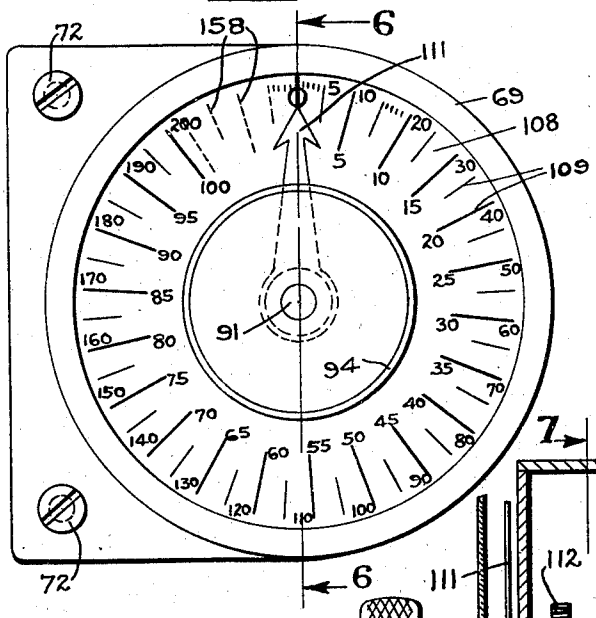
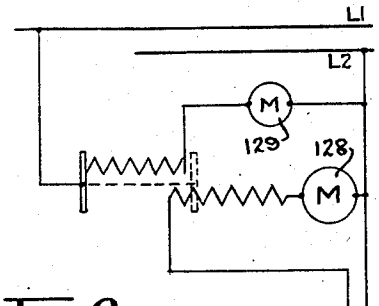


Fig.6.



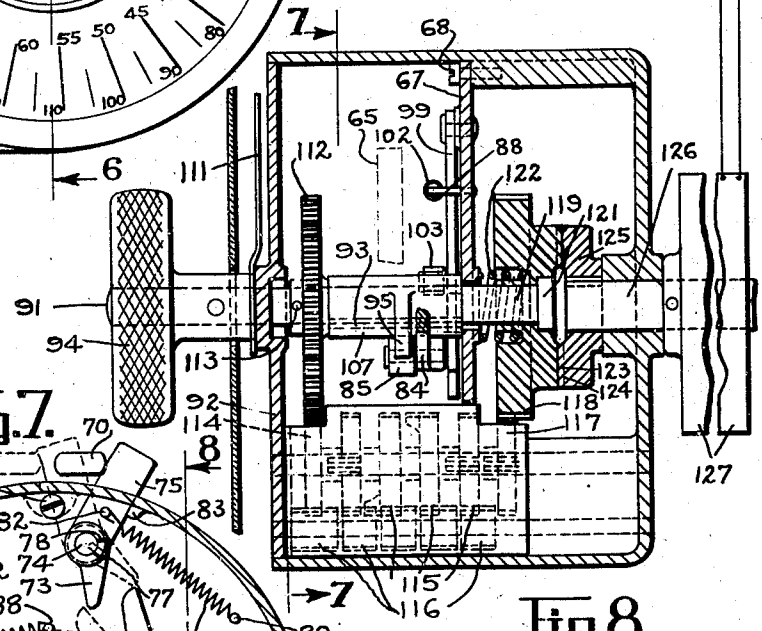


Fig.7.

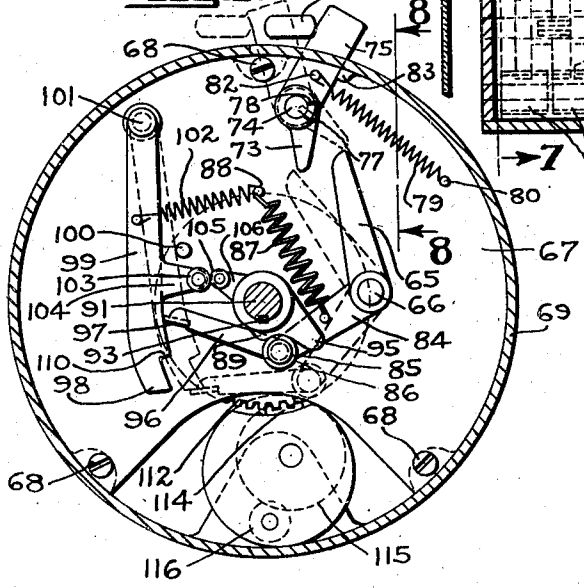
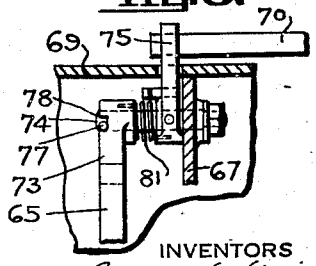


Fig.8.



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UNITED STATES PATENT OFFICE

2,220,903

PRINTING MACHINE

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Application December 28, 1937, Serial No. 182,080

18 Claims. (Cl. 101—92)

This invention relates to improvements in printing machines and more particularly to an imprinting mechanism for a printing machine whereby a heading or other imprinted matter may be positioned for printing on a running web a determined number of times corresponding to the desired number of products requiring such imprinting, and then another may be automatically positioned to be printed, without stopping the printing machine, in which the device is incorporated.

An imprinting mechanism is particularly useful in printing different headings on separate batches of products, the body of each of which is the same but which require different headings. For instance, the rotogravure sections of different newspapers may all be printed on the same printing machine and with the device of this invention a heading on the front sheet of the section, constituting the product, may be printed upon a desired number of sections, for one newspaper, and then another heading be automatically positioned for printing upon a desired number, for another newspaper, all without stopping the press to accomplish this result. The device is also useful for printing advertising pamphlets, fashion sheets, and the like, where the dealer's name and address is imprinted, and the same advertising matter is to be used by several dealers.

One object of this invention is to provide an imprinting mechanism adapted to perform the above stated functions and for cooperation with a printing machine.

Another object is to provide in an imprinting mechanism for printing headings on a running web, indexing means to selectively dispose each of a plurality of printing means for different headings in printing position.

A further object is to provide in an imprinting mechanism having indexing means to dispose printing means for different headings selectively in printing position, mechanism to control the operation of this means to cause the change over from one heading to another without stopping the printing machine with which the device coordinates.

A still further object is to provide means to control an imprinting mechanism of the above nature adapted to time the indexing operation in accordance with the number of products to be printed.

It is also an object of this invention to provide an imprinting mechanism of generally improved construction, whereby the same will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 diagrammatically illustrates a printing machine in which an imprinting mechanism, embodying the principles and features of this invention, has been incorporated;

Figure 2 is a broken transverse section of the imprinting mechanism shown in Figure 1;

Figure 3 is a broken vertical section of the imprinting mechanism and showing the indexing mechanism for the heading printing cylinder;

Figure 4 is a detail view of an indexing means timing and control mechanism;

Figure 5 is a face view of a product counting and control mechanism;

Figure 6 is a vertical sectional view taken through the mechanism shown in Figure 5 and generally along line 6—6 in that figure;

Figure 7 is a sectional view taken on line 7—7 of Figure 6;

Figure 8 is a detail sectional view taken on line 8—8 of Figure 7; and

Figure 9 is an electrical circuit layout of the controls for the indexing mechanism.

The printing machine illustrated in Figure 1 is adapted to print upon a web 11 running into the machine from a web roll 12, first on one side of the web by means of a first printing unit 13, then by means of rollers 15 and 16, to feed and guide the web 11, from the unit 13 to a second printing unit 14 to have it printed on the other side, and then, by means of rollers 17 and 18, to feed it between cooperating cylinders 19 and 21 of the imprinting mechanism of this invention. From the cylinders 19 and 21, the printed and imprinted web is then guided by rollers 22 and 23 into position to be associated with other webs, which are then folded in a folding mechanism 24.

The imprinting mechanism of this invention includes the impression cylinder 19 and the form cylinder 21 with suitable inking rollers 25 for the form cylinder 21. Herein, the form cylinder 21 is shown in Figure 2 as being provided with a plurality of printing faces 26, each being capable of printing a different heading upon the web as it is fed between the cylinder 21 and the cylinder 19, by cooperating with an impression pad 27 on

the cylinder 19. Although sixteen faces 26 are shown, it will be understood that there may be provided a fewer or greater number if desired and that these may be formed upon plates of the usual form adapted to be mounted upon the cylinder 21. It will also be understood that more than one pad 27 may be provided, for instance, two diametrically opposite ones, so as to print two headings at each revolution of the cylinders 19 and 21, in which case, there would be duplicate heading faces oppositely disposed on the cylinder 21.

As shown in Figure 2, only one heading printing face will cooperate with the impression pad 27 during each revolution of the cylinders 19 and 21 and this same heading will continue to be printed until the form cylinder 21 is moved relatively to the cylinder 19 an amount equal to the space from the center of one printing face 26 to the center of the next succeeding one.

The cylinders 19 and 21 are rotated in synchronism with each other, and with the printing units 13 and 14, by means of a shaft 28 extending from and being driven by the driving means of the printing machine (see Figures 2 and 3). A bevel gear 29 on the shaft 28 drives a meshing bevel gear 31 and through its shaft 32, a gear 33. In respect to the impression cylinder 19, a bevel gear 35 on the shaft 28 drives a bevel gear 36 on a vertical shaft 37 and through a bevel gear 38 on the cylinder shaft 39 drives the cylinder 19. In respect to the cylinder 21, the gear 33 drives a gear 34 which is secured on a shaft 40, suitably journaled in a machine frame portion 41, and which has a pinion 42 secured thereto. The pinion 42 drives a plurality of pinions 43, 44 and 45 rotatively mounted upon spindles 46 carried by a pinion frame 47. The pinions 43, 44 and 45 are in driving engagement with internal teeth 48 formed in a gear 49, carried by a bracket 51, which is rotatively supported on the shaft 40. The gear 49 by its exterior gear teeth 52 drives a gear 53 secured on the shaft 54 of the form cylinder 21.

The pinion frame 47 is provided with a hub 55, which is journaled in a machine frame portion 56. The pinion frame 47 has gear teeth 57 formed upon its periphery adjacent the machine frame portion 56. It will be understood that rotation of the pinion frame 47 will either superpose a rotative movement upon, or retard the rotative movement of, the gear 49, whereby the cylinder 21 will be given a movement relatively to the cylinder 19, by being driven faster or slower than the cylinder 19. Preferably this indexing is accomplished by retarding the rotation of the cylinder 21 relatively to the cylinder 19. Indexing the cylinder 21 will cause the face 26, cooperating with the pad 27, to be removed from this cooperating position, and the next, or another selected face 26 to be disposed in its place.

The means to index the cylinder 21 relatively to the cylinder 19, to dispose another printing face 26 in cooperative relation with the pad 27 is illustrated in Figures 2 and 3 as including an electric motor 58 having a shaft 59 upon which a worm gear 61 is secured, a worm wheel 62 driven by the gear 61 and a pinion 63 on the shaft 64 of the wheel 62. The pinion 63 is in driving engagement with the gear teeth 57 on the periphery of the pinion frame 47. Operation of the motor 58 will rotate the pinion frame 47 to index the cylinder 21 and dispose the next succeeding, or selected, printing face 26 in cooperative position with the pad 27 on the cylinder 19. If desired, any of the well known forms of impression cylinder throw-off devices may be provided to separate the cylinders 19 and 21 while the indexing operation is taking place.

In addition to the operation of the motor 58 to properly dispose a face 26 relatively to the pad 27, it is desirable to control the operation of the imprinting unit, or cylinders 19 and 21, in accordance with the number of copies, or products, desired, having each particular heading. Herein is shown cooperating mechanism, including electrical controls for the motor 58, whereby the operation of the cylinders 19 and 21, in respect to the number of a particular heading printed thereby, and the operation of the motor 58 to change the heading by indexing the cylinder 21, may be timed and controlled.

The mechanism for counting the number of headings printed by the cylinders 19 and 21, and for timing the operation of the motor 58 to index the cylinder 21 (see Figures 4, 5 and 6), includes an arm 65 pivoted on a pin 66 supported on a partition plate 67 secured by screws 68 within a casing 69. The casing 69 is adapted to be secured upon a machine frame portion 71, preferably adjacent the folding mechanism 24, by screws 72 (Figure 5). The arm 65 is adapted to engage a trip arm 73 pivotally mounted on a shaft 74 supported on the partition plate 67, and which actuates an electric switch actuating arm 75, also pivotally mounted on the shaft 74. The arm 75 is adapted to engage the operating lever arm 70 of a spring opened switch 76, mounted on the machine frame member 71 adjacent the casing 69. The trip arm 73 is connected to the shaft 74 for slight lost rotative movement relatively thereto by a pin 77 in the shaft 74 cooperating with the arm 73 in a recess 78. The arm 73 is maintained against the pin 77 by a spring 81 coiled about the shaft 74 and having its ends secured respectively to the arms 73 and 75. A spring 79 is connected to the arm 75 and to a post 80 supported on the plate 67 and a post 82 on the arm 75, to urge the arm 75 against a stop 83 to permit the lever arm of the switch 76 to be moved by its spring into open position. The free end of the arm 73 is adapted to lie in the path of swinging movement of the free end of the arm 65 to be engaged thereby when it is swung in one direction to operate the lever arm 70 of the switch 76 to close it, and then to be released, after a short interval, to permit the switch 76 to open.

Another arm 84, also pivoted upon the pin 66 and being connected to the arm 65 to swing the same has a roller 85 mounted upon its free end 86. A spring 87 connected to and extending from the arm 84 to a pin 88, secured to the plate 67, is tensioned to constantly urge the arm 65 into switch actuating or closing position, and the roller 85 against a cam 89 mounted upon a shaft 91 extending between and journaled in a casing cover 92 and the plate 67. The cam 89 is arranged to permit the shaft 91 to slide therethrough and by means of a key 93 to rotate the cam 89. The shaft 91 is extended beyond the cover 92 and has a manipulating knob 94 secured thereto, whereby the shaft 91 may be rotated to rotate the cam 89. Rotation of the cam 89 clockwise as shown in Figure 7 will, by means of a cam finger 95 which engages the roller 85, rock the arm 84 to swing the arm 65 against the tension of the spring 87, to set it in position to again actuate the arm 70 of the switch 76, to close the

same and through it the circuit in which the switch 76 is located.

A finger member 96 extends from the arm end 86 and, at its end, is provided with a short flange 97 adapted to have the lower end 98 of a catch arm 99 swing into its path, when the arm 84 is rocked by the cam finger 95 in a clockwise direction, to hold the finger member 96 in its rocked position and maintain the arm 65 in its set position. The catch arm 99 is pivoted upon a pin 101 attached to the plate 67 and is constantly urged into flange engaging and catching position by a spring 102 secured to, and extending between, the arm 99 and the pin 88. A pin 100 supported on the plate 67 limits the swinging movement of the arm 99. A roller 103 mounted on a lug 104, extending from the arm 99 toward the cam 89, is adapted to be engaged by a roller 105 secured to a lug 106 extending from the hub 107 of the cam 89, when the parts are in, or approaching, the position shown in Figure 7 to press the catch arm 99 out of the path of, and engagement with, the flange 97, to cause the arm 65 to actuate the switch 76 and close the circuit controlled thereby, while the arm 65 is moving into the full line position shown in Figure 7. In order to momentarily delay the release of the operating arm 70 of the switch 76, the arm 99 is provided with a catch shoulder 110, spaced rearwardly from its end 98, and upon which the finger member pauses during its movement into full line position (Figure 7), whereby the switch 76 is maintained closed a determined interval of time, for a purpose to be hereinafter described and which maintains the motor 58 running for a determined interval of time.

The casing 69 is provided with a dial face 108 having suitable indicia 109 thereon corresponding to the number of copies, or products desired. A pointer 111 secured to the knob 94 revolves over the face 108 and cooperates with the indicia 109, to indicate the setting of the switch actuating arm 65 by the cam finger 95 and the position of the roller 105 relatively to the catch arm 99. Obviously, rotation of the shaft 91 counterclockwise will cause the roller 105 to actuate the catch arm 99 to release the arm 65 as above described, and therefore, by rotating the shaft 91 in proportion to the number of products being imprinted, the arm 65 may be controlled to effect the closing of an electric circuit by the switch 76, to start the motor 58 and index the cylinder 21 to dispose another face 26 in printing position, after the desired number of product headings have been printed by the previously positioned face. In view of this, the pointer 111 may be set at an indicia mark 109 corresponding to the number of products desired imprinted, before the arm 65 actuates the switch 76 to close it.

As herein shown, two rows of indicia marks 109 are provided, the outer row indicating the number of products printed, when the sheets constituting the same are not collected, and the inner row indicating the number of products when the sheets are collected before folding them. It will be understood that when printing collected products, it is the usual practice to print from forms that extend substantially half way around the printing cylinder and duplicate forms are used, thus printing two identical products during each cylinder revolution. With such an arrangement, two pads 27 will be employed and duplicate printing faces 26 will be positioned on opposite sides of the cylinder 21. For collected products, the printing forms likewise extend substantially half way around the cylinder, but the two forms are different, one printing one portion of the product and the other printing another portion which is collected and folded with the first portion to form a complete product. For this arrangement, the single pad 27 of Figure 2 will be employed. For instance, when two pads 27 are used, the inner row of indicia marks 109 are observed and when only one pad 27 is used, the outer row is observed.

The shaft 91 obviously must be slowly rotated in a counterclockwise direction (Figure 6), to permit the pointer 111 to make substantially one revolution while a desired number of products is being printed, for instance 200,000. Herein, the shaft 91 is rotated by a gear 112, secured to the shaft 91 by a pin 113 so that the gear 112 will be unmeshed from a gear 114 when the knob 94 is manipulated to reset the mechanism. The gear 112 is driven by the last gear 114 of a series of reduction gears 115 and pinions 116 arranged in the well known manner of the common rotation counters, such as those of the "Veeder" type, the first one, 117 of the series of gears 115 being drivingly connected to a gear 118 rotatively mounted on the end 119 of the shaft 91 extending beyond the plate 67.

The gear 118 is retained on the shaft end 119 by an enlarged head 121, formed on the shaft end 119. The gear 118 and the shaft 91 together with all parts thereon is constantly urged, to the right as shown in Figure 6 by a spring 122 disposed and reacting between the end face of the gear 118 and the plate 67 to drivingly connect clutch teeth 123 and 124, formed respectively on the adjacent end faces of the gear 118 and a clutch part 125. The clutch part 125 is secured upon the end of a shaft 126 extending into the casing 69 and which is drivingly connected to the drive of the printing machine by a magnetic clutch 127, whereby it will be driven in synchronism with the cylinders 19 and 21. The magnetic clutch 127 is shown connected in parallel with the circuit of the printing machine operating motor 128 (see Figure 6), which motor 128 constitutes a means to effect the producing speed of the machine. As shown in Figure 6, the motor 128 is the main full speed machine driving motor, while another motor 129 is the slow speed driving motor which is used only when starting the machine and before actual production, and also for preparing the machine for production. Herein, the clutch 127 is energized when the motor 128 is placed in operation to operate the machine in the actual production of products. It will be understood that the clutch 127 may be arranged to be actuated by any other product controlling means so that an actual count of, and control by, the products being delivered will be obtained. By means of the clutch arrangement, constituted by the clutch teeth 123 and 124 on the gear 118 and the part 125, the shaft 91 may be pulled axially by the knob 94, to disconnect the drive shaft 126 from the driven mechanism in the casing 69, when it is desired to set the mechanism for the operation of counting the products to be imprinted and of controlling the electric circuit including the switch 76 as above described.

Another switch 131 (see Figures 3, 4 and 9) is mounted on, or adjacent to, the frame portion 56 and is positioned to have its operating arm 132 engaged by cam lugs 133 on a rotatable timing cam 134 which is driven in synchronism with the pinion frame 47 by being rotatably secured to a gear 135 driven by the gear teeth

57 on the pinion frame 47. The number of cam lugs 133 corresponds to the number of printing faces 26 on the cylinder 21, and the arrangement is such, that the switch 131 will be actuated to open an electric circuit, wherein it is included, when its operating arm 132 is engaged and actuated by one of the lugs 133, corresponding to the face 26 disposed in printing position in respect to the pad 27 by the indexing of the cylinder 21 by the motor 58.

Referring now to the electric circuit shown in Figure 9, the switch 76 and the switch 131 are shown in control of the operation of the motor 58, so as to cause it to be operated to rotate the pinion frame 47 to index the cylinder 21 and position another printing face 26 in cooperating relation with the pad 27 on the cylinder 19, after the desired number of headings have been imprinted by the preceeding, or previously selected face 26, and then to stop the motor 58. As herein shown, the motor 58 is connected by a conductor 136 to a line wire L2 and by a conductor 137 to one terminal of a switch 138, operated by a solenoid 139. The other terminal of the switch 138 is connected by a conductor 141 to the line wire L1. The solenoid 139 is connected by a conductor 142 to the line wire L2 and by a conductor 143 to one of the terminals of the switch 76. The other terminal of the switch 76 is connected by a conductor 144 to the line wire L1, whereby closing of the switch 76 will start the motor 58 to index the cylinder 21 by energizing the solenoid 139 to close the switch 138. The switch 76 is maintained closed as above described to insure sufficiently long operation of the motor 58 to rotate the cam 134 and cause the switch 131 to close.

One terminal of the switch 131 is connected by a conductor 145 to the line wire L2, and by a conductor 146 to one terminal of a solenoid 147, the other terminal of which is connected to the line wire L1 by a conductor 148. The solenoid 147 actuates a switch 149 which has one of its terminals connected by a conductor 151 to the line wire L1 and the other by a conductor 150 to the solenoid 139. A signal lamp, or bell 152 is connected by conductors 153 and 154 in parallel with the motor 58, so as to indicate when the latter is energized and in operation to index the cylinder 21. It will be understood by those versed in the art that if desired arrangements can be made to maintain the signal light 152 energized after the indexing operation has been completed to show the attendant that the mechanism has not been reset.

As shown in Figure 9, the switches 76 and 131 are normally open and therefore the motor circuit is normally open, due to the solenoid 139 being deenergized. This condition exists when the counting and control mechanism is set for a desired number of imprints and the printing cylinders 19 and 21 are in operation and printing. At the completion of the desired number of imprints, the catch arm 99 is moved out of its arm retaining position by the roller 105 whereby the switch 76 is momentarily closed to complete the circuit to the solenoid 139, which in turn closes the switch 138 to start the motor 58 to index the cylinder 21. At this time, the electric signal lamp, or bell 152 is energized to indicate to the machine attendant that the indexing operation has started and that the imprinting of the required number of headings has been completed, so that he will watch the delivered products to ascertain when the new headings start, and will also reset the mechanism in the casing 69 by manipulation of the knob 94 for the desired number of the headings to be imprinted by the newly positioned face 26.

As the pinion frame 47 rotates to index the cylinder 21, the cam lug 133 holding the switch 131 open is moved out of such position, permitting this switch to close, whereby the solenoid 147 is energized. Energization of the solenoid 147 closes the switch 149 to maintain the solenoid 139 energized and the motor 58 in operation, which motor operation will continue until the switch 149 is again opened by the next succeeding cam lug 133, corresponding to the next succeeding printing face 26 on the cylinder 21. During the period of motor indexing operation, the signal light 152 is maintained energized and when this operation is completed indicates this condition to the attendant by becoming deenergized, due to the opening of the switch 138.

When it is desired to continue the operation of the motor 58 to index the cylinder 21 to dispose a face 26, other than the next succeeding one, in printing position, a push button switch 155 is actuated to maintain a circuit including conductors 156 and 157 across the switch 131, to continue energization of the solenoids 139 and 147. By means of the switch 155, any one of the faces 26 may be selected.

The pointer 111, which constantly rotates counterclockwise while the cylinders 19 and 21 are printing headings, reaches the zero point at the same time the roller 105 engages the roller 103 to swing the arm end 98 out of engagement with the flange 97 to cause actuation of the arms 73 and 75 to close the switch 76 and start the indexing operation. The machine attendant, observing that the indicating lamp 152 is energized, watches for, and removes, the few products delivered while the cylinder 21 is being indexed and resets the pointer 111 to the number of products required to be imprinted by the next face 26, disposed in printing position. In the interim, the pointer 111 may have moved beyond the zero mark on the dial 108 and newly printed copies may have been delivered. Indicating marks 158 are provided beyond the zero mark, between it and the marks 109 indicating the maximum number, whereby the attendant may estimate the number of imprinted products having been delivered and when resetting the pointer 111 to the number desired, he may reset it short of the mark 109 indicating this number, in accordance with this estimate.

The operation of a printing machine having the imprinting mechanism of this invention incorporated therein includes, the forming of a plurality of printing faces 26 upon plates and mounting them on a form cylinder 21 and the provision of suitable cooperating impression pads 27 on the impression cylinder 19. The web 11 is then threaded through the entire machine at slow speed by operation of the motor 129. The pointer 111 is then set at the indicia mark 109 corresponding with the number of products to be imprinted by the face 26 with the heading first selected, and the motor 128 is started, whereby the magnetic clutch 127 will be energized to apply rotation to the shaft 126 and, through the clutch part 125 and gear 118, to the shaft 91, the direction of rotation of the shaft 91 being counterclockwise with reference to Figures 5 and 7.

Manual rotation of the shaft 91 from the zero mark to set the pointer 111 to print a desired number of products, rotates the cam finger 95 clockwise, moving the arms 96 and 65 from the position shown in full lines in Figure 7 to the dotted position, so that the flange 97 engages the lower end 98 of the catch arm 99, and moves the arm 65 into a position where it can engage the arm 73 to effect operation of the switch 76 when the pointer 111 is returned to the zero mark on the dial by completion of the printing of the desired number of impressions. The movement of the hand to zero mark also moves the roller 105 into engagement with the roller 103, thereby moving the catch arm 99 to the full line position shown in Figure 7.

The indexing motor 58 is then started, as above described, to dispose another face 26 in printing position. By the use of the above described imprinting mechanism, the printing machine can be continuously operated at high speed while headings are being imprinted and during the indexing of the cylinder 21. The change-over from one heading to another may be effected without the slightest interruption of machine operation, and with but comparatively few copies, or products, being wasted, the number being much less than the number wasted when such a change-over requires stopping and starting of the machine, with its attendant loss of time.

While there has been disclosed in this specification one form in which the invention may be embodied, it will be understood that it may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, and it will be further understood that each and every novel feature and combination present in or possessed by the mechanism herein disclosed forms a part of the invention included in this application.

What we claim is:

1. In a printing machine, a form cylinder carrying a plurality of forms, an impression cylinder having an impression surface adapted to cooperate with one of said forms, means to rotate said cylinders in unison and at equal speeds, and means for indexing said form cylinder with respect to the impression cylinder while they are rotating to bring the several forms selectively into engagement with the said impression surface, said means including an electric motor, and timing means driven in synchronism with said printing machine to control the actuation of said motor.

2. In a printing machine, a form cylinder having a plurality of different printing forms, an impression cylinder having an impression surface arranged to cooperate with any selected one of said forms to print products, means to rotate said cylinders in unison and at the same speed, means to index said form cylinder relatively to the impression surface to dispose any printing form in printing cooperation therewith including an electric motor, and timing means to control the actuation of said indexing motor and being operable to start the actuation thereof when a desired number of products have been printed.

3. In a printing machine, a form cylinder having a plurality of different forms, an impression cylinder having an impression surface to cooperate with any one of said forms to print products, means to rotate said cylinders in unison and at equal speeds, means to index said form cylinder relatively to said impression cylinder while they are rotating to dispose any one of said forms in printing position with respect to said impression surface, and means driven in synchronism with said cylinders to limit the number of products printed by the selected form.

4. In a printing machine, a form cylinder and an impression cylinder rotatable in unison and at equal speeds, said form cylinder having a plurality of different forms, said impression cylinder having an impression surface in cooperation with a first selected one of said forms to print products, a control device driven in synchronism with said cylinders, and mechanism controlled by said control device to move said form cylinder in respect to said impression cylinder to dispose another one of said forms in printing relation with said impression surface.

5. In a printing machine, a form cylinder and an impression cylinder rotatable in unison and at equal peripheral speeds, said form cylinder having a plurality of different forms, said impression cylinder having an impression surface in cooperation with a first selected one of said forms to print products, mechanism to move said form cylinder in respect to said impression cylinder to dispose another one of said forms in printing relation with said impression surface, and means driven in synchronism with said cylinders to count the number of products being printed and to actuate said cylinder moving mechanism after a desired number of products have been printed by the first selected form.

6. In a printing machine, a form cylinder having a printing plate upon its periphery, said plate having a plurality of printing forms thereon, an impression cylinder having an impression surface adapted to cooperate with only one of said forms, means to rotate said cylinders in unison and at equal speeds, mechanism to index one of said cylinders relatively to the other while they are rotating to selectively dispose one of the forms in printing relation with said impression surface, control means for said mechanism driven in synchronism with said cylinders and including a starting control operable when a desired number of impressions have been made from a selected form, and a stopping control driven by said indexing mechanism operable when a succeeding form is in printing position.

7. In a printing machine, a form cylinder having a printing plate upon its periphery, said plate having a plurality of printing forms thereon, an impression cylinder having an impression surface adapted to cooperate with only one of said forms, means to rotate said cylinders in unison and at equal speeds, mechanism to index one of said cylinders relatively to the other while they are rotating to selectively dispose one of the forms in printing relation with said impression surface, control means for said mechanism driven in synchronism with said cylinders and including a control adapted to be set to start the mechanism when a desired number of impressions have been made from a selected form, and a mechanism stopping control driven by said indexing mechanism operable when a succeeding form is in printing position.

8. In a printing machine, a form cylinder having a printing plate upon its periphery, said plate having a plurality of printing forms thereon, an impression cylinder having an impression surface

adapted to cooperate with only one of said forms, means to rotate said cylinders in unison and at equal speeds, mechanism to index one of said cylinders relatively to the other while they are rotating to selectively dispose one of the forms in printing relation with said impression surface, control means for said mechanism including a control adapted to be set to start the mechanism when a desired number of impressions have been made from a selected form, and means actuated by said control means to indicate when the indexing mechanism is in operation, the desired number of impressions have been made, and that it is time to reset said mechanism starting control.

9. In a printing machine, a form cylinder having a printing plate upon its periphery, said plate having a plurality of printing forms thereon, an impression cylinder having an impression surface adapted to cooperate with only one of said forms, means to rotate said cylinders in unison and at equal speeds, mechanism to index one of said cylinders relatively to the other while they are rotating to selectively dispose one of the forms in printing relation with said impression surface, control means for said mechanism including a control adapted to be set to start the mechanism when a desired number of impressions have been made from a selected form, means actuated by said control means to indicate when the mechanism is in operation, and a mechanism stopping control driven by said indexing mechanism and operable when the next succeeding form is in printing position.

10. In a printing machine, an imprinting mechanism including, an impression cylinder, a form cylinder having a plurality of printing forms thereon, means to rotate said cylinders in unison and at equal speeds including gearing connected to said form cylinder to drive it and being adapted to be actuated to rotate it relatively to said impression cylinder to dispose one of said printing forms in printing position, an electric motor for driving said gearing to rotate said form cylinder relatively to said impression cylinder, start and stop controls for said electric motor, a timing device adjustable in accordance with the number of imprints desired printed by the selected form to actuate the start control for said gearing driving motor when this desired number of imprints has been printed, and means driven by said gearing to actuate the stop control for said gearing driving motor when a succeeding form is positioned in printing position.

11. In a printing machine, an imprinting mechanism including, an impression cylinder, a form cylinder having a plurality of printing forms thereon, means to rotate said cylinders in unison and at equal speeds, including gearing connected to said form cylinder to drive it and being adapted to be actuated to rotate it relatively to said impression cylinder to dispose one of said forms in printing position, an electric motor for driving said gearing to rotate said form cylinder relatively to said impression cylinder, a start and stop control for said motor, a timing device driven in synchronism with said cylinders and being settable in accordance with the number of imprints desired printed by the selected form, to actuate the start control for said gearing driving motor when the desired number of imprints has been printed, a motor for driving said printing machine, means to drive said timing device only when said machine motor is operating, and means driven by said gearing to actuate the stop control for said gearing driving motor when a succeeding form is positioned in printing position.

12. In a printing machine, an imprinting mechanism including an impression cylinder, a form cylinder having a plurality of printing forms thereon, means to rotate said cylinders in unison and at equal speeds, means including an electric motor to move said form cylinder relatively to said impression cylinder to dispose one of the printing forms thereon in printing position, start and stop controls for said motor, a timing device adjustable in accordance with the number of imprints desired printed by the selected form to actuate the start control for said motor when this desired number of imprints has been printed, and means driven by said form cylinder moving means to actuate the stop control for said motor when a succeeding form is positioned in printing position.

13. In a printing machine, an imprinting mechanism including an impression cylinder, a form cylinder having a plurality of printing forms thereon, means to rotate said cylinders in unison and at equal speeds, means including an electric motor to move said form cylinder relatively to said impression cylinder to dispose one of the printing forms thereon in printing position, start and stop controls for said motor, a timing device adjustable in accordance with the number of imprints desired printed by the selected form, to actuate the start control for said motor when this desired number of imprints has been printed, means driven by said form cylinder moving means to actuate the stop control for said motor when a succeeding form is positioned in printing position, and means to continue the operation of said motor after said stopping control is in operable position whereby any succeeding one of said printing forms may be selected.

14. In a printing machine, a form cylinder having a plurality of different forms upon its periphery, an impression cylinder having an impression surface thereon arranged to cooperate with any selected one of said forms to print products, means to rotate said cylinders in unison and at equal speeds, means to move one of said cylinders relatively to the other to register any selected form with said impression surface, and timing means to control the actuation of said cylinder moving means.

15. In a printing machine, a plurality of printing forms, means having an impression surface adapted to register with a selected one of said forms to print upon a web running therebetween, a first means to move said printing forms and said impression surface in unison and at equal speeds, a second means to relatively move said printing forms and said impression surface while said first moving means is in operation, to register another one of said forms with said impression surface, and timing means in control of said second moving means to actuate it when a determined number of products have been printed by the first selected printing form.

16. In a printing machine, a form cylinder carrying a plurality of printing forms an impression cylinder carrying an impression surface adapted to cooperate with any one of said forms, means to rotate said cylinders in unison and at equal speeds, separately driven means to index said form cylinder relatively to said impression cylinder to register a selected form with said impression surface, and timing means driven by said cylinder rotating means and being in control of said cylinder indexing means.

17. In a printing machine, a form cylinder having a plurality of printing forms forming portions of its periphery, an impression cylinder having an impression surface upon its periphery adapted to cooperate with any one of said forms to print upon a web running therebetween, means to rotate said cylinders at substantially equal peripheral speeds, mechanism to move one of said cylinders relatively to the other while they are rotating to selectively register any one of said forms with said impression surface, and timed means to control the actuation of said cylinder moving means in accordance with the desired number of imprints made upon the web by a selected form.

18. In a printing machine, an imprinting mechanism including, a form cylinder having a plurality of different printing forms spaced apart upon its periphery, an impression cylinder having an impression surface adapted to cooperate with any one of the said forms to print products, means to rotate the said cylinders at substantially the same peripheral speed, mechanism to move the form cylinder to dispose any one of the forms in printing cooperation with the impression surface, control means, including means to count the products, operably to vary the number of products to be printed before the said cylinder moving mechanism is to operate, and means to automatically stop the operation of said cylinder moving mechanism after a printing form has been moved into printing position.

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