

July 11, 1939.

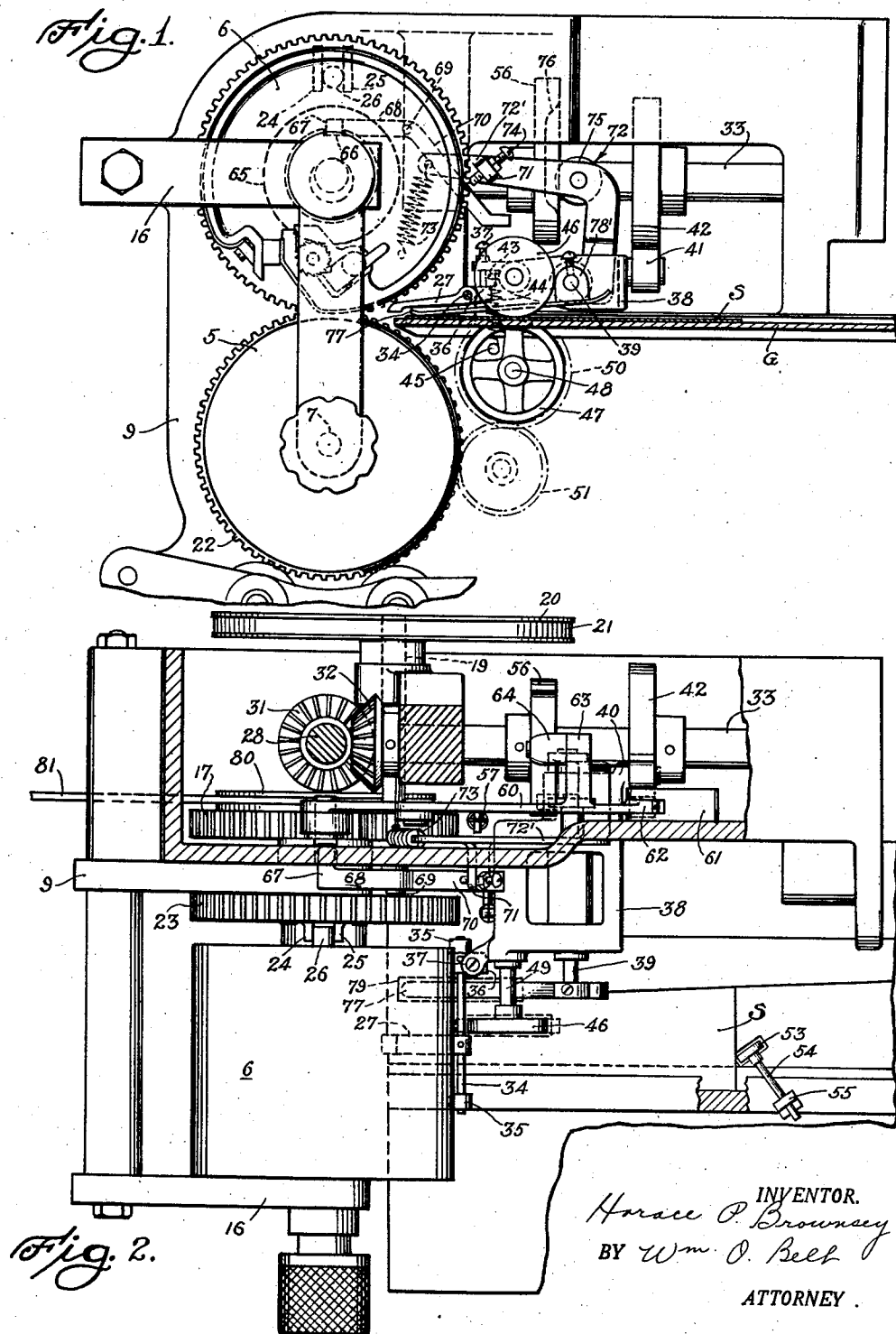
H. P. BROWNSEY

2,165,535

PRINTING MACHINE

Filed April 13, 1936

2 Sheets-Sheet 1



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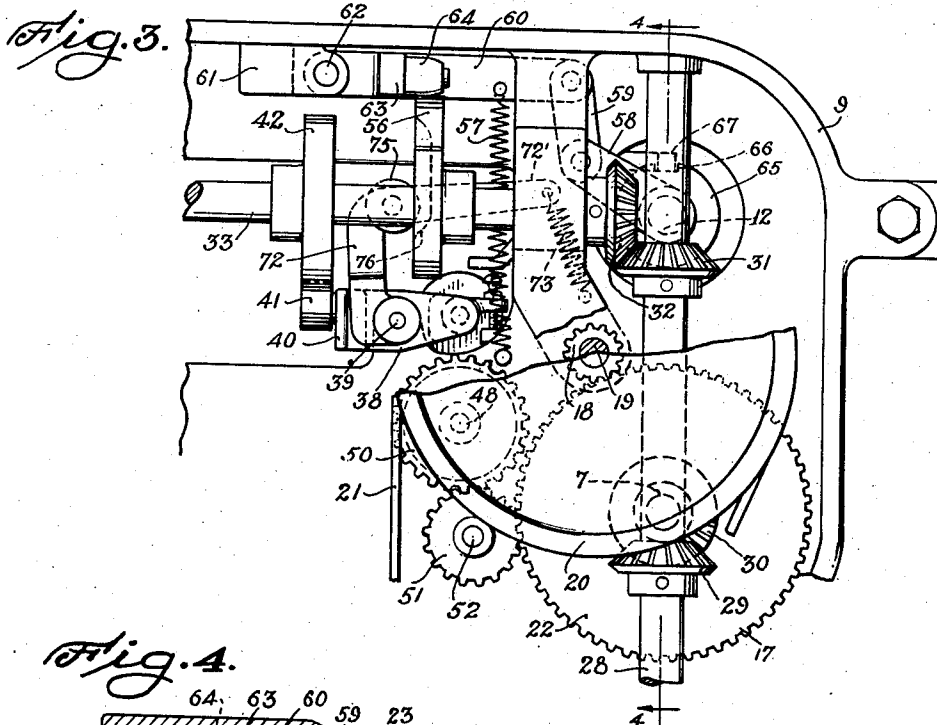
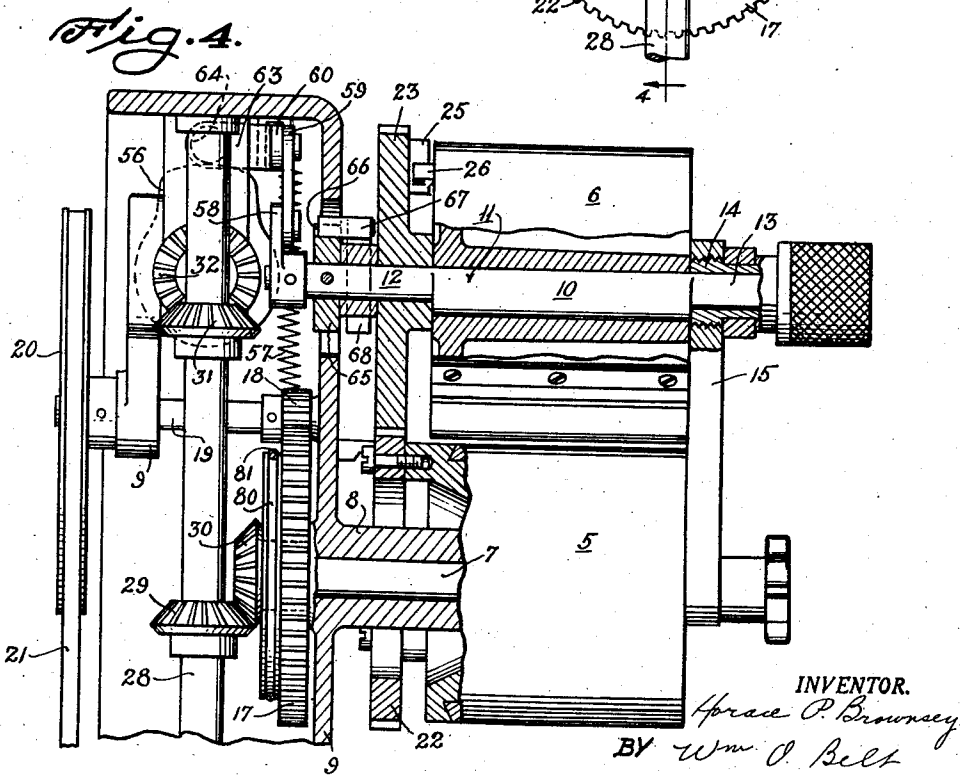
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,165,535

PRINTING MACHINE

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mesne assignments, to Addressograph-Multi-
graph Corporation, Cleveland, Ohio, a corpora-
tion of Delaware

Application April 13, 1936, Serial No. 74,044

21 Claims. (Cl. 101—247)

This invention relates to printing machines of the kind wherein utility bills, checks, insurance notices and the like are printed, and the primary object is to print constantly reoccurring matter, such as a form, on bills, checks, notices and the like during passage thereof through the machine.

Bills, checks, notices and the like are fed through printing machines of the kind to which this invention relates as parts of an elongated web or in the form of separate elongated strips which may either be cut from a web in the machine or which may be pre-cut and suitably stacked in the machine for passage therethrough. During passage through the machine the bills and the like usually have variable information printed thereon, such as an address or the like, from printing devices sequentially fed through the machine, and the constantly reoccurring matter such as the form is printed on the bills or the like so that there is a permanent relation in the relative positions of the variable information and constantly reoccurring matter. A machine of this kind is shown in the Hartley Patent 1,955,806, patented April 24, 1934, wherein a printing couple is shown for printing the form on bills passed therethrough, and another important object of the present invention is to provide a novel printing couple adapted for use in a machine such as that shown in the aforesaid Hartley patent.

The bills, checks, notices and the like are sequentially fed through machines of the kind to which this invention relates and the printing operations are performed thereon at relatively high speed to enable rapid production thereof, and another object of my invention is to provide a novel printing couple for printing the form on bills or the like which may be operated at a relatively high speed, and ancillary objects are to rigidly support the printing cylinders of the printing couple and to enable quiet operation of the printing couple at relatively high speeds.

Further objects of the invention are to provide a printing couple embodying a printing cylinder bearing a printing form, such as an electroplate or the like, and a platen cylinder bearing a blanket or the like with which a make-ready may be associated, and to synchronously operate the printing and platen cylinders so that corresponding parts thereof will cooperate in each printing operation thereof whereby uniform impressions will be made thereby; to provide intermeshing gears for synchronously driving the printing and platen cylinders and to maintain said gears in uniform intermeshing relation during operation

of the printing couple; to prevent formation of offsets on the blanket of the platen cylinder by preventing cooperation between the printing and platen cylinders when no bill or the like is available for passage therethrough; and to maintain the printing and platen cylinders in printing relation so long as bills or the like are available for passage therethrough.

A selected embodiment of my invention is illustrated in the accompanying drawings wherein

Fig. 1 is a front elevation;

Fig. 2 is a top plan in which a part of the frame is broken away;

Fig. 3 is a rear elevation; and

Fig. 4 is a vertical sectional view taken substantially on the line 4—4 on Fig. 3.

In the preferred form of my invention illustrated in the accompanying drawings, 5 indicates the printing cylinder and 6 the platen cylinder of my novel printing couple. An electroplate or other printing form may be retained on the printing cylinder 5 in the manner shown in the Kranz Patent 1,955,814, patented April 24, 1934, or in any other suitable way, and ink may be supplied to this printing form in the manner shown in Kranz Patent 1,946,217, patented February 6, 1934, although it is to be understood that other suitable ink supplying means may be provided without departing from the purview of my invention. In order that neat and uniform impressions may be made on bills, checks, notices and the like by the printing couple, the platen cylinder 6 is preferably equipped with a tensionable blanket in the manner shown in the Kranz Patent 1,937,119, patented November 28, 1933, although it is to be understood that the platen cylinder 6 may be equipped with a blanket or equivalent means in any desired way without departing from the purview of my invention as long as uniform impressions from the printing form on the printing cylinder 5 are insured.

The printing cylinder 5 is fast on a shaft 7 journaled in a sleeve 8 of the frame 9 for the printing couple. The platen cylinder 6 is mounted on the eccentric part 10 of a shaft 11 which includes concentric bearings 12 and 13. The bearing 13 is journaled in a bushing 14 (Fig. 4) secured in one end of a strap 15 and a suitable journal is also provided for the outer free end of the shaft 7 in this strap 15. A brace 16 (Fig. 2) is secured to the strap 15 at the end thereof in which the bushing 14 is secured and this brace is rigidly connected to the frame 9. The brace 16 and strap 15 afford an overhanging bearing structure for the outer free ends of the shafts 7

and 11 and increase the rigidity of the printing couple.

A gear 17 is fast on the shaft 7 and meshes with a pinion 18 fast on the shaft 19 journaled in the frame 9 and having a pulley 20 thereon about which a belt 21 is passed, said belt extending to a suitable source of power such as an electric motor (not shown) whereby power is supplied to the shaft 19 to rotate the pinion 18 and the gear 17 and therefore the shaft 7.

A gear 22 is fast to the cylinder 5 as, for example, in the manner illustrated in Fig. 4, and meshes with a gear 23 rotatably mounted on the bearing 12 of the shaft 11, said bearing 12 being journaled in the frame 9. As best illustrated in Figs. 1 and 2, a pair of lugs 24 and 25 is provided on the side of the gear 23 facing the cylinder 6 and a stud 26 on this cylinder fits between these lugs. The gears 22 and 23 are of an equal size and have a corresponding number of teeth and therefore when the shaft 7 is rotated and as the cylinder 5 rotates therewith this movement is transmitted from the gear 22 to the gear 23 to the stud 26 and cylinder 6 wherefore the cylinders 5 and 6, which are of equal size, are operated synchronously.

In the present instance bills, checks, notices or the like are fed to the bight between the cylinders 5 and 6 in the form of elongated strips S along a guideway G and the sheets pass into engagement with a stop finger 27 which is shown out of stopping position in Fig. 1, but when this finger is lowered into stopping position it holds the sheet until the printing form on the printing cylinder 5 is in a predetermined position relative to the sheet engaged with the stop finger, whereupon the stop finger is raised and the sheet is then fed into the bight between the cylinders 5 and 6 to have an impression made thereon. It will thus be seen that the stop finger 27 is raised and lowered in timed relation with the rotation of the cylinders 5 and 6 and this is brought about by means now to be explained.

A vertical shaft 28 is journaled in the frame 9 and has a bevel gear 29 fast thereon which meshes with a bevel gear 30 fast on the shaft 7. Another bevel gear 31 is fast on the shaft 28 and meshes with a bevel gear 32 fast on the shaft 33 suitably journaled in the frame 9 and which may be extended into a machine with which the printing couple of this invention is associated to drive operative parts in such machine if so desired. The ratio between the gears 29 and 30 and 31 and 32 is preferably one-to-one and it will therefore be seen that the shaft 33 operates in timed relation with the shaft 7 and therefore the cylinders 5 and 6.

The stop finger 27 is fast on a shaft 34 journaled in bosses 35 (Fig. 2). An arm 36 is also fast on this shaft and provides an abutment engageable by an adjustable pin 37 mounted in a rocker 38 pivotally mounted on a shaft 39 suitably journaled in the frame 9. An arm 40 (Fig. 2) on the rocker 38 carries a roller 41 engageable with a peripheral cam 42 fast on the shaft 33. A stud 43 (Fig. 1) is fast in the rocker 38 and one end of a spring 44 is fast thereto and the other end of this spring is connected to a spring anchor 45 fast in the frame 9. The spring 44 so acts on the rocker 38 that the roller 41 is urged into engagement with the peripheral cam 42. Configuration of the peripheral cam 42 is such that at a predetermined time in the operation of the printing couple a relieved part on the cam moves into engagement with the roller 41 whereupon

the rocker 38 is moved by the spring 44 and the adjustable pin 37 engages the arm 36 and pivots the shaft 34 to elevate the stop finger 27 out of stopping position into the position shown in Fig. 1, whereupon the sheet S which has been engaged therewith is moved into the bight between the cylinders 5 and 6 to have an impression made thereon.

In order that movement of the sheet S into the bight between the cylinders 5 and 6 at the time the stop finger 27 is elevated will be assured, suitable feeding means are provided comprising the rollers 46 and 47. The roller 47 is mounted on a shaft 48 and a part of the periphery thereof extends through an opening in the sheet guideway G. The roller 46 is mounted on a shaft 49 journaled in the rocker 38 and, when the rocker 38 moves under the action of the spring 44 to elevate the stop finger 27, the roller 46 is lowered to thereby clamp the sheet therebelow in engagement with the rotating roller 47 whereupon the sheet is fed into the bight between the cylinders 5 and 6. The shaft 48 on which the roller 47 is mounted has a gear 50 fast thereon which meshes with a pinion 51 carried by the stud shaft 52 journaled in the frame 9 and the pinion 51 meshes with the gear 17. The ratio between the gear 17, pinion 51 and gear 52 is such that the shaft 48 and therefore the roller 47 rotates rather rapidly and therefore a sheet clamped between the rollers 46 and 47 is rapidly fed into the bight between the cylinders 5 and 6. The pinion 51 is interposed between the gears 17 and 50 to rotate the roller 47 in a direction such that the sheet will be fed into the bight between the cylinders 5 and 6.

As the sheets move along the sheet guideway G they move under the roller 53 (Fig. 2) on shaft 54 of small motor 55 mounted on the side of the sheet guideway. This roller cooperates with the bottom of the sheet guideway to clamp the sheet and insures movement of the sheets into position below the roller 46 and into engagement with stop finger 27. Moreover, as illustrated, shaft 54 and roller 53 are inclined relative to the extent of the sheet guideway wherefore the sheets are forced against the side of the sheet guideway, and since this side is aligned with the printing form on printing cylinder 5 proper alignment of the sheet and printing form is assured. Preferably the roller 53 is so positioned that the sheet is out of engagement therewith when it engages the stop finger 27.

If the cylinders 5 and 6 are permitted to remain in cooperating relation during operation of the printing couple, offsets will be formed on the blanket on the cylinder 6 when no sheet passes between these cylinders, but this is prevented by moving the platen cylinder 6 from cooperative relation with the printing cylinder 5 when no sheet is available for movement between these cylinders.

The shaft 11 includes concentric bearings 12 and 13 and an eccentric part 10 on which the cylinder 6 is mounted and this shaft 11 is arranged for movement so that the most eccentric portion of the eccentric part 10 may be moved into and from a position wherein this most eccentric portion is extended toward the cylinder 5. Such movement of the shaft 11 is effected by a peripheral cam 56 and a spring 57 in a manner now to be explained.

An arm 58 is fast on bearing 12 and one end of a link 59 is pivotally connected thereto. The other end of the link 59 is pivotally connected

to a rocker 60 and the opposite end of this rocker is pivotally mounted in a bifurcation in the block 61 as indicated at 62. As best illustrated in Fig. 2, an arm 63 extends outwardly from the rocker 60 and carries a roller 64 that is urged against the peripheral cam 56 by the spring 57.

Since the cam 56 is fast on the shaft 33 it operates in timed relation with the cylinders 5 and 6 and about the time the stop finger 27 is elevated to free a sheet engaged therewith a lobe on the cam 56 engages the roller 64 and pivots the rocker 60 upwardly, thereby positioning the toggle afforded by the link 59 and arm 58 in the position shown in Fig. 3. Movement of the toggle into this position imparts movement to the link 58 which therefore rotates the bearing 12, and this rotation of the bearing 12 is such that the most eccentric portion of the eccentric part 10 of the shaft 11 is moved to extend toward the cylinder 5 whereby the cylinder 6 is moved into cooperating relation with the cylinder 5 so that an impression will be made on a sheet fed into the bight between these cylinders.

As best shown in Fig. 4 the lobe on cam 56 is relatively short and hence a short time after the rocker 60 is pivoted upwardly the roller 64 moves off this lobe and the spring 57 therefore pivots the rocker 60 downwardly which shortens the toggle afforded by the link 59 and arm 58 and moves these parts into a position wherein the angle between the upper edges thereof is reduced. Such movement rotates the most eccentric portion of the eccentric part 10 away from the cylinder 5 whereby the cylinder 6 no longer cooperates with the cylinder 5. The roller 64 moves from engagement with the lobe of cam 56 in this manner prior to the time the electroplate or other printing form on the cylinder 5 moves into cooperative relation with the blanket or the like on the cylinder 6, and therefore the formation of offsets on the blanket or the like is prevented. However, if a sheet is fed into the bight between the cylinders 5 and 6 an impression is to be made thereon and hence means controlled by the presence or absence of a sheet in association with the stop finger 27 determines whether or not the spring 57 is to move the rocker 60 downwardly, and if the rocker 60 is not to be moved downwardly, as when a sheet is fed into the bight between the cylinders 5 and 6, means for locking the most eccentric portion of the eccentric part 10 in its position extended toward the cylinder 5 function and hold said portion 10 in this position.

Such means include the collar 65 fast on the bearing 12 between the arm 58 and the gear 23, as best shown in Fig. 4. This collar has a notch 66 therein in which a stop lug 67 is engageable. This stop lug is carried by a rocker 68 (Figs. 1 and 2) pivotally mounted on the frame as indicated at 69. The rocker includes a downwardly extending portion 70 (Fig. 1) that extends below a lug 71 on arm 72' of rocker 72 that is fast on the shaft 39.

One end of a spring 73 is connected to the free end of the arm 72' of the rocker 72 and the other end of this spring is suitably connected to the frame 9, and this spring urges an adjustable stop 74 mounted in the lug 71 toward the downwardly extending portion 70 of the rocker 68. A roller 75 is provided on the rocker 72 and this roller is urged toward one side of cam 56 by the spring 73. A depression 76 is provided in this side of the cam 56 and at a time in the operation after the rocker 60 has been pivoted upwardly the roller

75 moves into the depression 76 if a sheet has not been engaged with the stop finger 27 which, of course, means that no sheet is moving into the bight between the cylinders 5 and 6.

When the roller 75 moves into this depression the stop 74 is moved downwardly by the spring 73 and engages the extension 70 whereupon the stop lug 67 is pivoted out of the notch 66. Therefore, when the roller 64 starts to move off the lobe on cam 56, the spring 57 may pivot the rocker 60 downwardly wherefore the cylinder 6 will be moved away from the cylinder 5 as previously explained.

The depression 76 is relatively short and shortly after the roller 75 moves thereinto the end of the depression engages the roller 75 and pivots the rocker 72 so that the stop 74 is disengaged from the portion 70 whereupon the stop lug 67 moves into engagement with the periphery of disc 65. At this time, however, the notch 66 will not be below the lug 67 but in the next operation when the rocker 60 pivots upwardly the notch 66 will be moved below the lug 67 which will thereupon seat in said notch.

If a sheet is engaged by the stop finger 27, the stop lug 67 will remain in this notch and to this end a detecting finger 77 carried by a block 78 fast on the shaft 39 rides on a sheet engaged with the stop finger 27. When the detecting finger 77 rests on a sheet engaged with the stop finger 27, the roller 75 is prevented from passing down into the depression 76 and therefore the stop 74 does not engage the portion 70 and the lug 67 remains in the notch 66. Therefore, as long as sheets successively move into engagement with the stop finger 27 the stop lug 67 will remain in the notch 66 and the cylinder 6 will be maintained in cooperating relation with the cylinder 5. When, however, no sheet is engaged with the stop finger 27, the detecting finger 77 moves into the depression 79 (Fig. 2) in the bottom of the printing device guideway, and when this occurs the roller 75 may move into the depression 76 with the effect above described, that is to say, movement of the cylinder 6 out of cooperating relation with the cylinder 5.

It will thus be seen that once the cylinders 5 and 6 have been moved into cooperating relation, this relation is maintained until a sheet fails to move into engagement with the stop finger 27 and when this occurs the stop lug 67 is moved out of the notch 66 and therefore the spring 57 will cause the cylinders 6 to be moved out of cooperating relation with the cylinder 5 and this, as stated, will occur before an offset is formed on the blanket or the like on the cylinder 6.

In addition to the extent of the shaft 33 into the machine to operate operative parts therein other means such as a stacking device into which the sheets move after passage thereof through the printing couple may be operated, and to this end a pulley 80 is fast on the shaft 7 adjacent the gear 30 and a belt 31 is passed thereabout and directed to such other means to be operated as the stacking device.

It will be manifest from the foregoing description that I have provided a printing couple comprising printing and platen cylinders that are gear connected so as to operate synchronously, and inasmuch as the gears remain in constant mesh it is possible to operate the cylinders at relatively high speed without appreciable noise, and since the cylinders may operate at high speed impressions may be made thereby quite rapidly. Moreover by reason of the fact that an

overhanging bearing structure is provided a rigid printing couple is afforded which will make uniform neat impressions.

Furthermore unnecessary separation of the printing cylinders is avoided since once the cylinders are in cooperating relation they are maintained in this relation as long as sheets are available for passage through the bight therebetween. When, however, no sheet is available for passage between the cylinders the cylinders are separated, that is to say, moved out of cooperating relation and in this way the formation of offsets on a blanket or the like on a platen cylinder is prevented.

While I have illustrated and described a preferred form of my invention it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the scope of the following claims.

I claim:

1. In a printing couple, a pair of cylinders, means supporting said cylinders for relative movement into and out of cooperative relation with each other, means for interconnecting said cylinders for synchronic cyclic operation, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, yieldable means effective on at least one of said cylinders and operable to dispose said cylinders out of cooperative relation, operating means effective against the action of said yieldable means for moving said cylinders into cooperative relation, means operating in timed relation with said drive shaft for effecting operation of said operating means at the beginning of a cycle of operation of said cylinders, latch means for retaining said cylinders in cooperative relation, other means operating in timed relation with said drive shaft for rendering said latch means ineffective subsequent to the operation of said operating means, and means for rendering said other means ineffective under predetermined operating conditions to enable said latch means to be effective to retain said cylinders in cooperative relation unless and until said other means render said latch means ineffective in a subsequent cycle of operation.

2. In a printing couple, a pair of cylinders for making impressions on sheets fed therebetween, means supporting said cylinders for relative movement into and out of printing relation with each other, means for interconnecting said cylinders for synchronic cyclic operation whereby an impression is made on a sheet by said cylinders in each cycle of operation thereof in which the cylinders are in printing relation with each other, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, yieldable means effective on at least one of said cylinders and operable to urge said cylinders out of printing relation with each other, means including a part operating in timed relation with said drive shaft and effective against the action of said yieldable means for disposing said cylinders in printing relation with each other, latch means for retaining said cylinders in printing relation against the action of said urging means, other means also including a part operating in timed relation with said drive shaft, said other means being operable to render said latch means ineffective subsequent to operation of the means effective against the action of said yieldable means, and means for rendering

said other means ineffective under predetermined operating conditions to enable said latch means to be effective to retain said cylinders in cooperative relation unless and until said other means render said latch means ineffective in a subsequent cycle of operation.

3. In a printing couple, a pair of cylinders for making impressions on sheets fed therebetween, means supporting said cylinders for relative movement into and out of printing relation with each other, means for interconnecting said cylinders for synchronic cyclic operation whereby an impression is made on a sheet by said cylinders in each cycle of operation thereof in which the cylinders are in printing relation with each other, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, yieldable means effective on at least one of said cylinders and operable to urge said cylinders out of printing relation with each other, operating means effective against the action of said yieldable means for disposing said cylinders in printing relation with each other, means operating in timed relation with said drive shaft for effecting operation of said operating means at the beginning of a cycle of operation of said cylinders to establish or maintain printing relation between said cylinders, latch means for retaining said cylinders in printing relation against the action of said urging means, other means including a part operating in timed relation with said drive shaft, said other means being operable to render said latch means ineffective subsequent to the operation of said operating means, and detecting means for preventing said other means from rendering said latch means ineffective upon cooperation of the detecting means with a sheet to be passed to said cylinders whereby said latch means is effective to retain said cylinders in printing relation with each other against the action of said yieldable means unless and until said other means are rendered effective in a subsequent cycle of operation in which no sheet is present for cooperation with said detecting means.

4. In a printing couple, a pair of cylinders, means interconnecting said cylinders for synchronic cyclic rotation, a support shaft including a journaled concentric bearing portion and an eccentric portion, one of said cylinders being mounted for rotation on said eccentric portion, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, yieldable means acting on said support shaft to urge it into a position wherein the eccentric portion is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, means for rotating said support shaft against the action of said yieldable means and operable to dispose the eccentric portion in a position wherein the cylinder rotatably mounted thereon is disposed in operative relation with the other of said cylinders, means operating in timed relation with said drive shaft and operable at the beginning of a cycle of operation of said cylinders to effect operation of the means for rotating said support shaft against the action of said yieldable means, latch means for retaining said support shaft in the position into which it is moved against the action of said yieldable means and operable to retain the cylinder on said support shaft in cooperative relation with the other of said cylinders, still other means including a part operating in timed relation with the drive shaft and

operable to render said latch means ineffective subsequent to the operation of the means for rotating said support shaft, and means for rendering said other means ineffective under predetermined operating conditions to enable said latch means to be effective to retain said cylinders in cooperative relation unless and until said other means render said latch means ineffective in a subsequent cycle of operation.

5. In a printing couple, a pair of cylinders for making impressions on sheets fed therebetween, means interconnecting said cylinders for synchronic cyclic rotation, a support shaft including a journaled concentric bearing portion and an eccentric portion, one of said cylinders being mounted for rotation on said eccentric portion, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, yieldable means acting on said support shaft to urge it into a position wherein the eccentric portion is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, means for rotating said support shaft against the action of said yieldable means and operable to dispose the eccentric portion in a position wherein the cylinder rotatably mounted thereon is disposed in operative relation with the other of said cylinders, means operating in timed relation with said drive shaft and operable at the beginning of a cycle of operation of said cylinders to effect operation of the means for rotating said support shaft against the action of said yieldable means, latch means for retaining said support shaft in the position into which it is moved against the action of said yieldable means and operable to retain the cylinder on said support shaft in cooperating relation with the other of said cylinders, still other means including a part operating in timed relation with the drive shaft and operable to render said latch means ineffective subsequent to the operation of the means for rotating said support shaft, and detecting means for preventing said other means from rendering said latch means ineffective upon cooperation of the detecting means with a sheet to be passed to said cylinders whereby the latch means is effective to retain said cylinders in cooperative relation with each other against the action of said yieldable means unless and until said other means are rendered effective in a subsequent cycle of operation.

6. In a printing couple, a pair of cylinders, means interconnecting said cylinders for synchronic cyclic rotation, a support shaft including a journaled concentric bearing portion and an eccentric portion, one of said cylinders being mounted for rotation on said eccentric portion, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, an arm connected to said concentric bearing portion, means including a spring acting on said arm to urge the support shaft into a position wherein the eccentric portion is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, means including a part operable in timed relation with said drive shaft at the beginning of a cycle of operation of said cylinders and operable through said arm to rotate said support shaft against the action of said spring to dispose the eccentric portion in a position wherein the cylinder rotatably mounted thereon is disposed in operative relation with the other of said cylinders, latch means for retaining said support

shaft in the position into which it is moved against the action of said spring and operable to retain the cylinder on said support shaft in cooperating relation with the other of said cylinders, still other means including a part operating in timed relation with the drive shaft and operable to render said latch means ineffective subsequent to the operation of the means for rotating said support shaft, and means for rendering said other means ineffective under predetermined operating conditions to enable said latch means to be effective to retain said cylinders in cooperative relation unless and until said other means render said latch means ineffective in a subsequent cycle of operation.

7. In a printing couple, a pair of cylinders, means interconnecting said cylinders for synchronic cyclic rotation, a support shaft including a journaled concentric bearing portion and an eccentric portion, one of said cylinders being mounted for rotation on said eccentric portion, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, an arm connected to said concentric bearing portion, means including a spring acting on said arm to urge the support shaft into a position wherein the eccentric portion is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, means including a cam operable in timed relation with said drive shaft at the beginning of a cycle of operation of said cylinders and operable through said arm to rotate said support shaft against the action of said spring to dispose the eccentric portion in a position wherein the cylinder rotatably mounted thereon is disposed in operative relation with the other of said cylinders, latch means for retaining said support shaft in the position into which it is moved against the action of said spring and operable to retain the cylinder on said support shaft in cooperating relation with the other of said cylinders, still other means including a cam operating in timed relation with the drive shaft and operable to render said latch means ineffective subsequent to the operation of the means for rotating said support shaft, and means for rendering said other means ineffective under predetermined operating conditions to enable said latch means to be effective to retain said cylinders in cooperative relation unless and until said other means render said latch means ineffective in a subsequent cycle of operation.

8. In a printing couple, a pair of cylinders for making impressions on sheets fed therebetween, means interconnecting said cylinders for synchronic cyclic rotation, a support shaft including a journaled concentric bearing portion and an eccentric portion, one of said cylinders being mounted for rotation on said eccentric portion, a drive shaft, means for driving the interconnected cylinders from and in timed relation with said drive shaft, an arm connected to said concentric bearing portion, operating means including a spring acting on said arm to urge the support shaft into a position wherein the eccentric portion is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, cam means operating in timed relation with said drive shaft and operable on said operating means against the action of said spring to dispose the eccentric portion on said support shaft in a position wherein the cylinder rotatably mounted thereon is disposed in operative relation with the other of said cylinders,

latch means for retaining said support shaft in a position into which it is moved against the action of said spring and operable to retain the cylinder on said support shaft in cooperating relation with the other of said cylinders, still other means including another cam operative in timed relation with the drive shaft, said other means being operable to render said latch means ineffective subsequent to the operation of the means for rotating said support shaft, and detecting means for preventing said other means from rendering said latch means ineffective upon cooperation of the detecting means with a sheet to be passed to said cylinders whereby the latch means is effective to retain said cylinders in cooperative relation with each other against the action of said yieldable means unless and until said other means are rendered effective in a subsequent cycle of operation.

9. In a printing couple, a pair of cylinders, means interconnecting said cylinders for cooperating relation, a shaft including concentric bearing portions and having an eccentric portion between said bearing portions, one of said cylinders being mounted for rotation on said eccentric portion, an arm connected to one of said bearing portions, a rocker connected to said arm, a cam follower on said rocker, a cam operating in timed relation with said cylinders, means acting on said rocker to urge said cam follower into engagement with said cam, a dwell on said cam engageable by said cam follower to so position said rocker, arm and shaft that the eccentric portion on said shaft is disposed to position the cylinder mounted thereon out of operative relation with the other of said cylinders, a portion on said cam for so positioning said rocker, arm and shaft that the eccentric portion of said shaft is positioned to move the cylinder thereon into operative relation with the other of said cylinders, means for retaining said shaft in such position that the eccentric portion thereof disposes the cylinder thereon in operative relation with said other of said cylinders and including means on one of said bearing portions and releasable latch means cooperating with the means on said one of said bearing portions, detecting means for determining whether or not a sheet is available for passage between said cylinders and operative to effect release of said releasable latch means upon the absence of a sheet, and means on said cam for timing the operation of said detecting means.

10. In a printing couple, a first cylinder, a second cylinder, a gear permanently connected to the first cylinder, a second gear meshed with the first gear, and means connecting the second gear to the second cylinder and affording relative movement between the second gear and the second cylinder whereby the second cylinder may be moved relative to the first cylinder without demeshing said gears.

11. In a printing couple, a first cylinder, a second cylinder, means for moving the second cylinder relative to the first cylinder, a gear permanently connected to the first cylinder, a second gear meshed with the first gear, and means connecting the second gear to the second cylinder and affording relative movement between the second gear and the second cylinder whereby the second cylinder may be moved relative to the first cylinder without demeshing said gears.

12. In a printing couple, a first cylinder, a second cylinder, means for moving the second cylinder relative to the first cylinder, a gear permanently connected to the first cylinder, a second gear meshed with the first gear, and means con-

necting the second gear to the second cylinder and affording relative movement between the second gear and the second cylinder whereby the second cylinder may be moved relative to the first cylinder without demeshing said gears, said connecting means including a pair of spaced members having a third member positioned therebetween for movement relative thereto, the pair of spaced members being mounted on one of the parts connected by the connecting means and the third member being mounted on the other of the parts.

13. In a printing couple, a first cylinder, a second cylinder, means for moving the second cylinder relative to the first cylinder, a gear permanently connected to the first cylinder, a second gear meshed with the first gear, a pair of spaced lugs mounted on the second gear, and a pin mounted on the second cylinder and positioned between said lugs, the disposition of said pin between said lugs insuring rotation of the second cylinder with the second gear and permitting relative movement between the second gear and the second cylinder whereby the second cylinder may be moved relative to the first cylinder without demeshing said gears.

14. In a printing couple, a printing cylinder, a platen cylinder, means for feeding a sheet into the bight between said cylinders to have an impression made thereon, means for holding said sheet against movement into the bight between said cylinders, and including a finger engageable with the leading edge of a sheet and normally positioned to engage the leading edge of a sheet, movable means engageable with said finger to retract it from sheet engaging position, a cam follower carried by said movable means, a cam operable in timed relation with said cylinders and acting directly on said cam follower to effect retraction of said finger at a predetermined time in the operation of said cylinders, and a roller under control of said cam to be engageable with a sheet upon retraction of said finger from engagement with the leading edge of said sheet.

15. In a printing couple, a platen cylinder, a printing cylinder, means for arresting movement of a sheet into the bight between said cylinders and including a finger engageable with the leading edge of a sheet and normally positioned to engage the leading edge of a sheet, means for feeding a sheet into the bight between said cylinders and including a clamping roller, rockable means positioned to have the portion thereof projecting forwardly from the pivot thereof engageable with said finger to be operable to retract said finger from sheet engageable position from the forwardly projecting end when said forwardly projecting end is lowered, said clamping roller being mounted in the forwardly projecting end of said rockable means to be engageable with a sheet when the forwardly projecting end of said rockable means is lowered, and a cam operable in timed relation with said cylinders and engageable with the rearwardly projecting portion of said rockable means and operative to effect upward movement of said rearwardly projecting portion and downward movement of the forwardly projecting portion at a predetermined time in the operation of said cylinders to thereby disengage said finger from a sheet and engage said clamping roller with a sheet at said predetermined time in the operation of said cylinders.

16. In a printing couple including a frame, a pair of shafts supported by said frame and extending outwardly therefrom, a printing cylinder

mounted on one of said shafts between said frame and the outer end of the shaft, a platen cylinder mounted on the other of said shafts between said frame and the outer end of said shaft, brace means extending outwardly from said frame and connected to the outer end of one of said shafts, and a member having the outer ends of said shafts journaled therein and cooperating with the brace means to support the outer ends of said shafts from said frame and thereby rigidly support said cylinders to insure uniform neat impression operations thereof.

17. In a printing couple including a frame, a pair of shafts supported by said frame and extending outwardly therefrom, a printing cylinder mounted on one of said shafts between said frame and the outer end of the shaft, a platen cylinder mounted on the other of said shafts between said frame and the outer end of said shaft, brace means extending outwardly from said frame and connected to the outer end of one of said shafts, a member having the outer ends of said shafts journaled therein and cooperating with the brace means to support the outer ends of said shafts from said frame and thereby rigidly support said cylinders to insure uniform neat impression operations thereof, means connecting one of said cylinders to one of said shafts for rotation therewith, means for imparting rotating movement to said shaft, a gear rigidly connected to said one of said cylinders, a second gear rotatably mounted on the other of said shafts and meshed with the first gear, and means connecting the second gear to the cylinder mounted on the other of said shafts for imparting rotative movement to said cylinders, said connecting means affording relative radial movement between said second gear and the cylinder rotatable therewith.

18. In a printing couple including a frame, a pair of shafts supported by said frame and extending outwardly therefrom, a printing cylinder mounted on one of said shafts between said frame and the outer end of the shaft, a platen cylinder mounted on the other of said shafts between said frame and the outer end of said shaft, brace means extending outwardly from said frame and connected to the outer end of one of said shafts, a member having the outer ends of said shafts journaled therein and cooperating with the brace means to support the outer ends of said shafts from said frame and thereby rigidly support said cylinders to insure uniform neat impression operations thereof, one of said shafts having an eccentric portion intermediate the journaled portions thereof, the cylinder mounted on said shaft being mounted on said eccentric portion, means for rotating said shaft to move the eccentric portion thereof whereby the cylinder mounted thereon may be moved to and from cooperative relation with the other of said cylinders, a gear mounted on this shaft in spaced relation with the eccentric portion thereof, means connecting said gear and the cylinder mounted on said shaft for rotative movement with one another and affording relative radial movement between said gear and cylinder, and a second gear rotatable with the other cylinder and meshed with the first gear, the means affording relative radial movement between the first gear and the cylinder rotatable therewith permitting the cylinder to be moved relative to the other cylinder without demeshing said other gears.

19. In a printing couple, a printing cylinder having a printing form fast thereon in a predetermined position axially thereof, a sheet guideway having a part thereof aligned with a determined part in the axial extent of said printing form, a stop finger for regulating the passage of sheets into the bight of said printing couple, and means for engaging sheets to be passed through said printing couple and operable to urge the sheets laterally into engagement with said part of said guideway to thereby arrange the sheets in predetermined relation with said printing form prior to the engagement of the sheets with said printing form, the sheet engaging means being spaced from said stop finger in an amount greater than the length of the sheets whereby said sheets are engaged with said part of said guideway prior to engagement thereof with said stop finger and said sheets are disengaged from the sheet engaging means upon engagement thereof with said stop finger.

20. In a printing couple, a printing cylinder having a printing form fast thereon in a predetermined position in the axial extent thereof, a sheet guideway having a part arranged in radial relation with said printing cylinder, said part being aligned with a predetermined part in the axial extent of said printing form, stop means operable to regulate the passage of sheets into the bight of said printing couple, and means for feeding sheets through said guideway toward said stop means and said printing couple and operable on the sheets to urge said sheets laterally so as to engage corresponding edges of the sheets with said part of said guideway to thereby arrange said sheets in predetermined relation with said printing form prior to engagement of the sheets with said printing form, said sheet feeding means being spaced from said stop means in an amount greater than the length of said sheets whereby the sheets are engaged with said part of said guideway prior to engagement thereof with said stop means and said sheets are disengaged from the sheet feeding means upon engagement thereof with said stop means.

21. In a printing couple, a printing cylinder having a printing form fast thereon in a predetermined position in the axial extent thereof, a sheet guideway having a part arranged in radial relation with said printing cylinder, said part being aligned with a predetermined part in the axial extent of said printing form, means for feeding sheets through said guideway toward said printing couple and including a roller arranged in angular relation with said part of said guideway, said roller being operable to force corresponding edges of said sheets laterally into engagement with said part whereby said sheets are arranged in predetermined relation with said printing form prior to engagement thereof with said printing form, and stop means operable to regulate the passage of the sheets in the bight of said printing couple, said roller being spaced from said stop means in an amount slightly greater than the length of said sheets whereby said sheets are engaged with said part of said guideway prior to engagement thereof with said stop means and said sheets are disengaged from the roller upon engagement thereof with said stop means.

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