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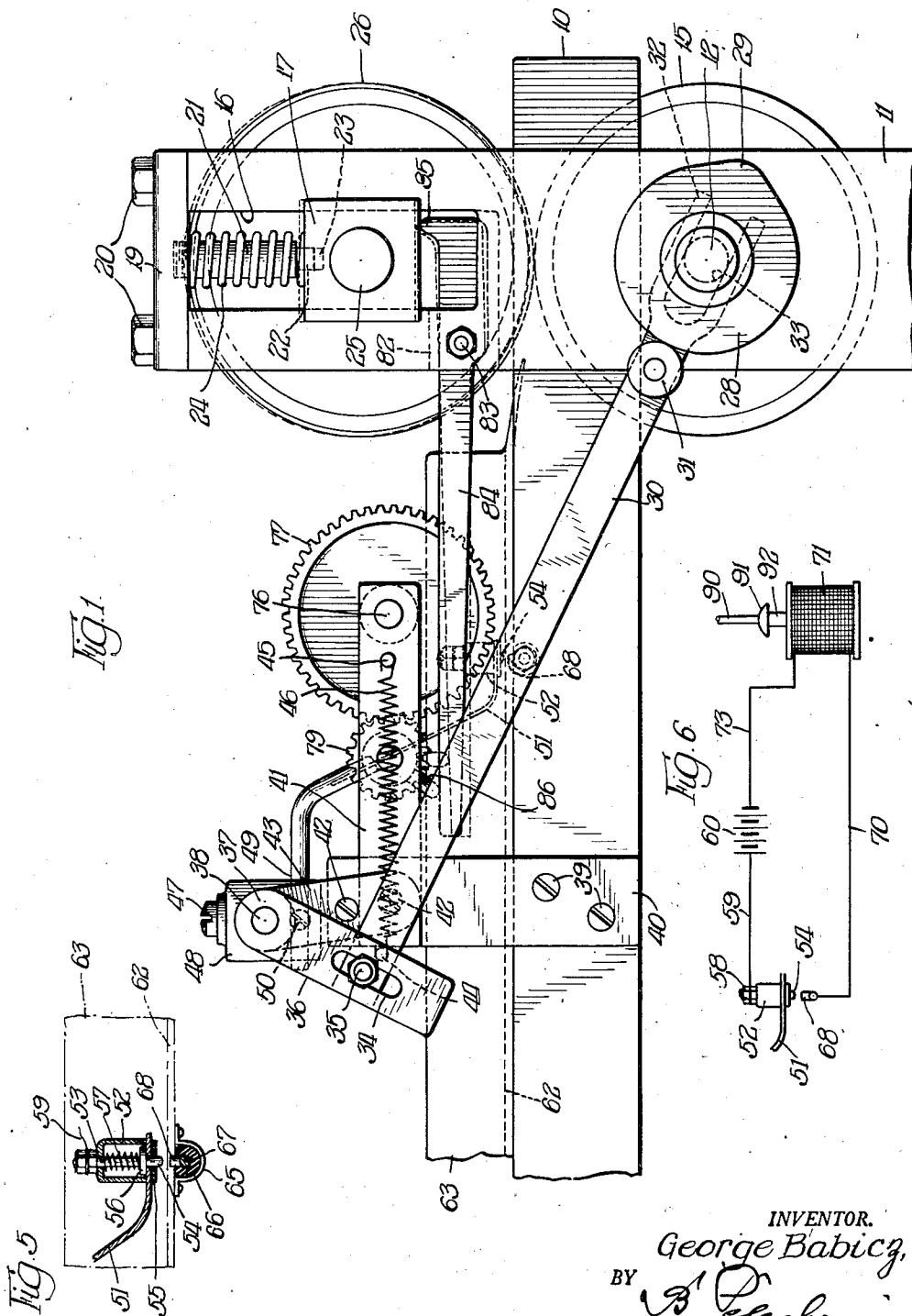
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2,432,133

DEVICE FOR SEPARATING PRINTING ROLLERS IN THE ABSENCE OF PAPER SHEET

Filed Dec. 13, 1944

3 Sheets-Sheet 1



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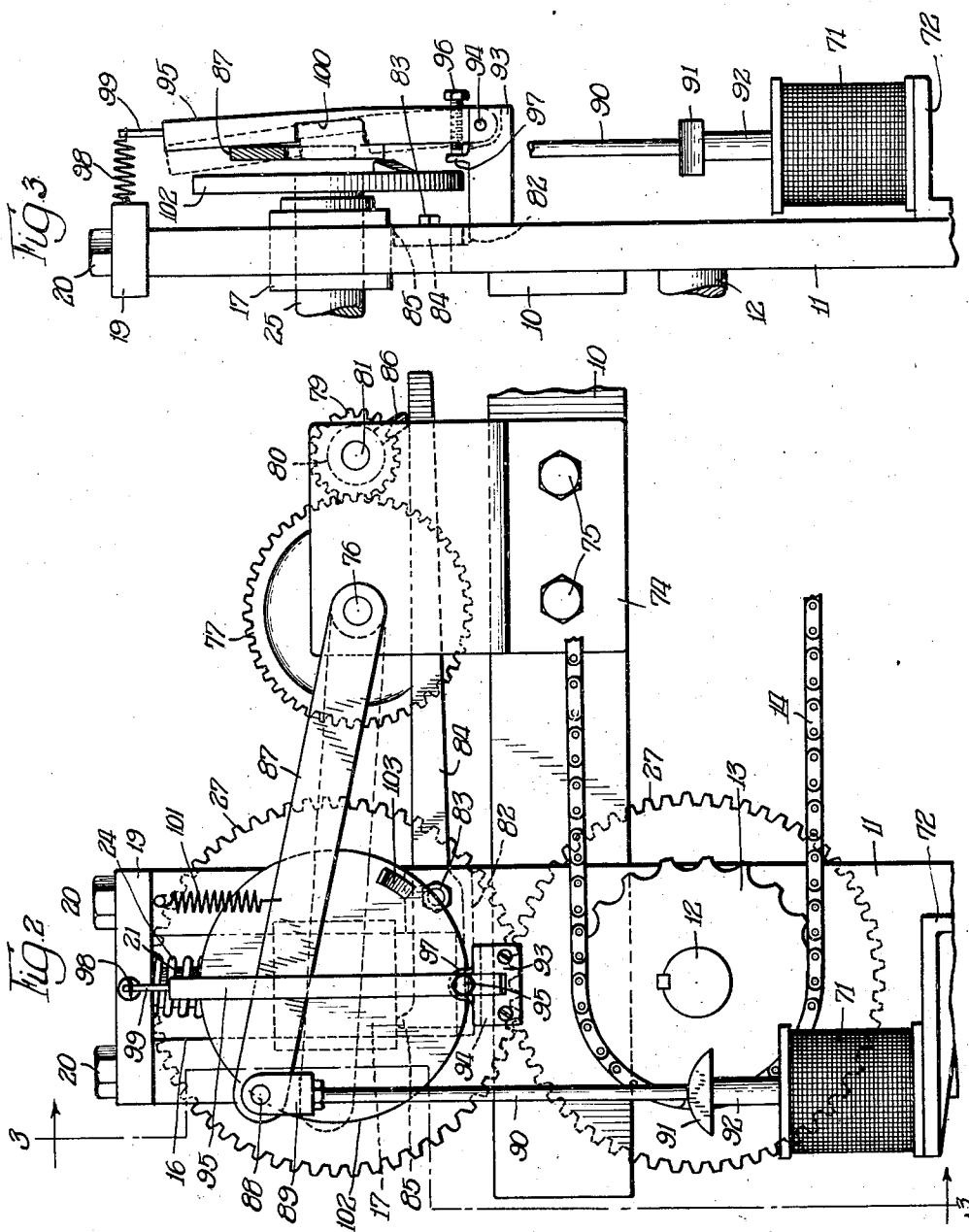
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DEVICE FOR SEPARATING PRINTING ROLLERS IN THE ABSENCE OF PAPER SHEET

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3 Sheets-Sheet 2



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DEVICE FOR SEPARATING PRINTING ROLLERS IN THE ABSENCE OF PAPER SHEET

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3 Sheets-Sheet 3

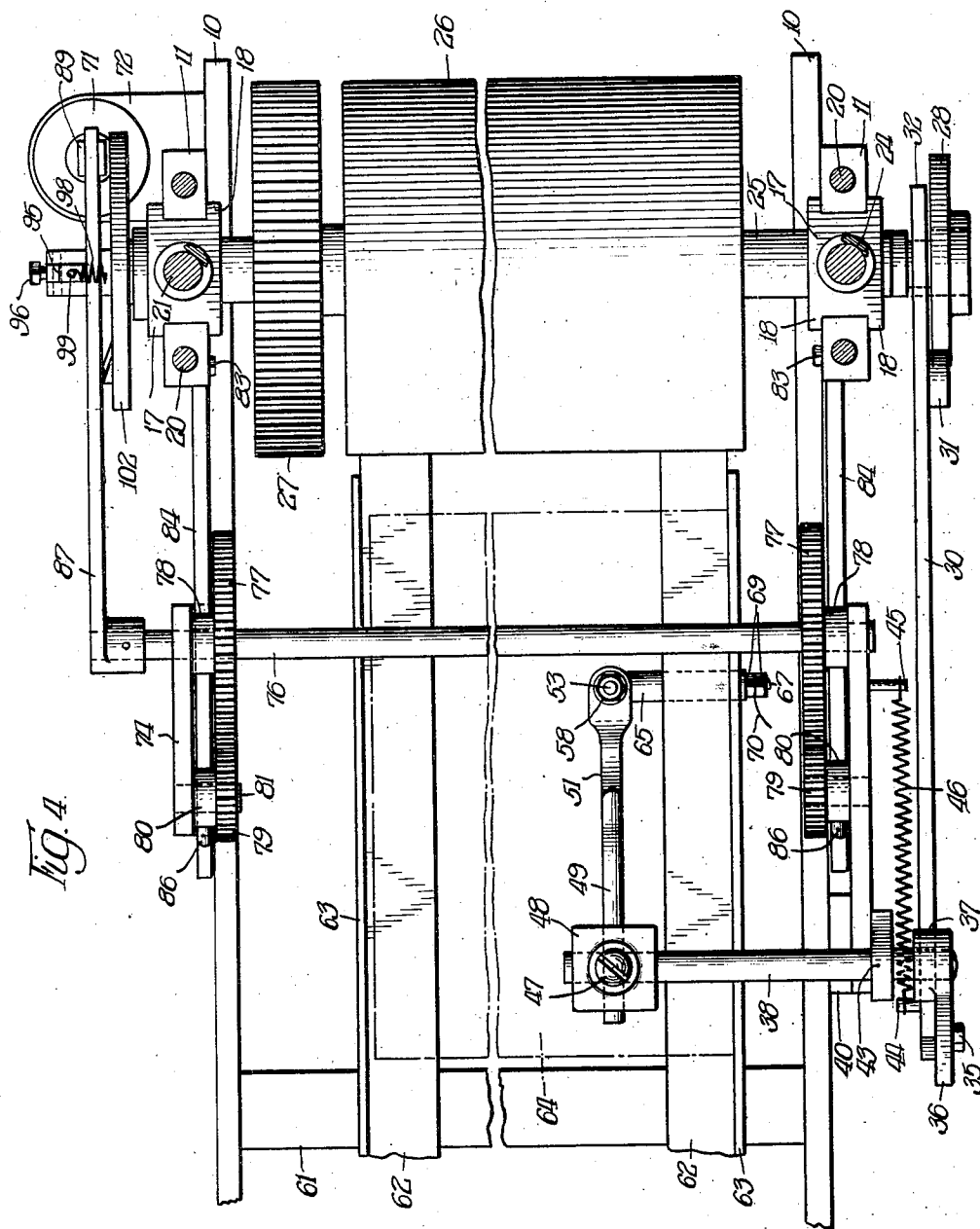


Fig. 4.

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UNITED STATES PATENT OFFICE

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DEVICE FOR SEPARATING PRINTING
ROLLERS IN THE ABSENCE OF PAPER
SHEET

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Application December 13, 1944, Serial No. 568,023

9 Claims. (Cl. 101—233)

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The present invention broadly relates to machines having a plurality of contacting rollers between which a material is fed, in combination with an electrical device for automatically separating the rollers when the material ceases to be fed therebetween for any reason. More specifically the invention relates to printing machines for the purpose of separating rollers so that the compressing roller may not unnecessarily gather ink when in contact with the printing roller when the paper to be fed therebetween to receive printing impressions ceases to be fed between the rollers.

A still further object of the present invention is the provision of a suitable electrical means including an electric circuit insulated from the machine, including a pair of contacts, one of which intermittently shifts towards the other, and in the path of the sheets of paper as it is fed towards the printing rollers, and whereby said contacts may complete an electric circuit in the absence of the paper so as to energize a solenoid, the latter connected with suitable mechanism for separating the rollers when the paper ceases to be fed therebetween.

A still further object of the present invention is the provision of a suitable mechanism whereby the rollers, on their separation, as aforesaid, make intermittent contact so as to grasp the paper as the same commences to be fed anew in between the rollers.

With the above general objects in view and others that will appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the appended claims.

In the drawing forming a part of this application and in which like designating characters refer to corresponding parts throughout the several views:

Fig. 1 is a side elevational view of one end of a printing machine;

Fig. 2 is a side elevational view thereof from the opposite side;

Fig. 3 is a fragmentary, elevational end view of the machine, partly in section, the view having been taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a top plan elevational view of the machine;

Fig. 5 is an enlarged cross-sectional view through the electric contacts; and

Fig. 6 is a diagrammatic view of the electric circuit.

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Referring in detail to the present drawings there is shown therein a pair of horizontal spaced frame bars 10, supported in any suitable manner by and upon four standards 11, two of which are shown in the drawings.

Supported upon standards 11 and within any suitable bearings therein is shaft 12, which is driven by means of sprocket wheel 13, keyed thereto, and sprocket chain 14. Said sprocket wheel 13 and chain 14 are disposed outwardly of one of said standards 11. Carried by said shaft 12 is printing roller 15 which is disposed between a pair of end standards 11, as is seen in Fig. 4.

The upper ends of standards 11 are bifurcated with slots 16 wherein bearings 17 are receivable, and wherein the same are adapted for upright shifting movement, being guided in that movement by means of flanges 18 which engage the body of each of said standards 11 and at the marginal edges of said slots 16.

Said standards 11 are topped by plates 19 which are affixed thereto by means of screws 20. In threaded engagement with each of said plates 19, and downwardly depending therefrom is a cylindrical bar 21, which has a reduced, lower end 22, receivable within socket 23 made at the upper end of each of said bearings 17. Interposed between the bottoms of said plates 19 and upper ends of bearings 17, and encompassing each of said cylindrical bars 21, is coil spring 24, normally bearing against bearings 17, and urging the same downwardly. Set within bearings 17 for rotary movement is shaft 25 which carries compressing roller 26. Shafts 12 and 25 carry gear wheels 27, which mesh and through which the rotary movement of shaft 12 is transmitted to shaft 25, whereby rollers 15 and 26 rotate in opposite direction so as to receive the paper as the same is fed towards and between them for transferring thereto printing impressions from roller 15 while the paper is pressed thereto by roller 26.

At the opposite end of shaft 12 there is keyed thereto cam 28 which has rise 29 at one point of its periphery, for the purpose of actuating bar 30 through contact with idler 31 carried by said bar 30. The lower end of said bar 30 is bifurcated as at 32, within which the grooved portion 33 of shaft 12 fits, thereby maintaining the lower end of bar 30 in its operative position and without interfering with the operation of said shaft 12.

Attached in an adjustable fashion by means of slot 34 and bolt 35 is link 36, having an enlarged head 37 at one of its ends, and within which shaft 38 is keyed. It will therefore be seen that through the medium of slot 34 and bolt 35, which passes

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through said slot 34 and rigidly engages the upper end of bar 30, said link 36 may be angularly adjusted upon said bar 30.

Affixed to the outer face of frame bar 10 by means of screws 39 is an upright frame bar 40, to the outer face of which a horizontal supporting member 41 is affixed in any suitable manner. Affixed to the outer face of said supporting member 41 and to the upper end of frame bar 40 by means of screws 42 is arm 43, which extends above frame bar 40, and by its upper end supports shaft 38 within which the same is freely mounted for rotary movement.

The upper end of bar 30 carries a transverse pin 44, and a like pin 45 is affixed to supporting member 41, for the purpose of attaching thereto coil spring 46, which tends to urge bar 30 towards shaft 12, thereby maintaining idler 31 in constant contact with cam 28.

Suspended upon the inner end of shaft 38, and in a transverse, as well as longitudinal adjustable relation therewith, and maintained thereon in its adjusted position by means of screw 47 is block 48, which by its lower end carries rod 49, which is longitudinally adjustable within said block 48 and readily engaged therewith in its adjusted position by means of screw 50. By its opposite angularly bent end said rod 49 carries a resilient strip 51, which by its free end carries a rigidly affixed inverted cup-like member 52 through which rod 53 is extended in a longitudinal relation. Said rod 53 terminates at its lower end in contact 54 which extends through strip 51 and insulating pad 55. Rod 53 adjacent its lower end has flange 56. Set upon rod 53 and interposed between flange 56 and the top wall of member 52 is coil spring 57 which urges contact 54 downwardly. A pair of nuts 58 engage the extended upper end of rod 53 in a threaded engagement, and interposed between said nuts 58 is one end of wire 59, the other end connecting with battery 60. It is of course understood that cup-like member 52, contact 54, flange 56, rod 53 and nuts 58 are insulated from strip 51 in any suitable manner, as well as from the entire machine.

Supported by transverse frame bars 61, which connect with frame bars 10 is a pair of horizontal guides 62 and a pair of vertical guides 63 upon and within which paper 64 is guided in its shifting movement towards rollers 15 and 26 as the same is fed thereto by means of suitable conveyor, the latter not shown in the drawings.

Affixed to the underface of one of said guides 62 is channel 65 filled with insulation 66, within which rod 67 is embedded. One end of said rod 67 terminates in an upwardly extending contact 68, in alinement with contact 54. The opposite end of said rod 67 extends beyond channel 65, and is threaded to receive a pair of nuts 69 in a threaded relation, for clamping therebetween one end of wire 70. The latter wire connects by its other end with solenoid 71, which is supported upon shelf 72 adjacent the lower end of one of standards 11. Wire 73 connecting with battery 60 and solenoid 71, completes the electric circuit.

The upper end of contact 68 is substantially on a plane of the upper face of guide 62 and therefore on the plane of the shifting paper as the same is fed towards rollers 15 and 26.

From the hereinabove description it will be readily seen that due to the action of cam 28 intermittent longitudinal shifting movement to bar 30 is imparted, rise 29, when contacting with idler 31 shifts said bar 30 in one direction, while spring 46 retracts said bar 30 to its stationary,

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original position as riser 29 leaves said idler 31. By virtue of this arrangement bar 30 is shifted away from shaft 12, and returned thereto, once during each revolution of cam 28 and roller 15. This intermittent shifting of bar 30 is transmitted to shaft 38, imparting thereto rocking movement through the medium of link 36. This rocking movement of shaft 38 is in turn transmitted to block 48, thereby causing intermittent movement of the outer end of strip 51, and vertical movement of cup-like member 52 for intermittently bringing contact 54 toward contact 68 and away from it. Normally paper travels between contacts 54 and 68 upon guides 62, and there is no interference with the vertical shifting movement of contact 54 by the paper. The oscillation of contact 54 continues independently of paper as the same is fed to rollers 15 and 26, except that as long as paper continues to be fed, the same constitutes an insulating gap between contacts 54 and 68, preventing the completion of the electric circuit through wires 59 and 73 and battery 60 for energizing solenoid 71. If however there is no paper upon guides 62 contacts 54 and 68, directly touching each other on downward shifting of contact 54, will complete said circuit to energize said solenoid 71. It is further observed that the downward shifting movement of contact 54 towards contact 68 occurs once during each revolution of rollers 15 and 26 due to the action of rise 29 upon cam 28, as the former actuates idler 31 and shifts bar 30 for rocking shaft 38, block 48, rod 49 and strip 51 for imparting intermittent oscillatory movement to contact 54 as hereinabove described.

On the opposite side of the machine plate 74 is affixed to the adjacent frame bar 10 by means of screws 75, the upper portion of which extends above the upper edge of said adjacent frame bar 10, and is off-set from that face outwardly. Mounted within one end of supporting member 41 and the upper portion of plate 74 is shaft 76, which is disposed transversely of the machine, and above vertical guides 63. Said shaft 76 carries a gear wheel 77 adjacent each of its ends and in a vertical alinement with each frame bar 10. Each of said gears 77 has an integrally formed bearing 78, spacing each gear from supporting member 41 or plate 74. Meshing with each gear 77 is pinion 79, each having an integrally formed bearing 80. Said pinions 79 and their bearings 80 are set upon shafts 81, rigidly carried by supporting member 41 and plate 74, and upon which said pinions 79 are set for rotary movement when actuated by gears 77.

Set within recess 82 made in the inner face of each standard 11, and pivoted thereon by means of bolt 83 is lever 84, which is disposed below bearings 78 and 80 and in alinement therewith, and on a plane between gears 77 and pinions 79 and their respective supporting member 41 and the upper end of plate 74. One end of each lever 84 has an upwardly projecting extension 85, which contacts with and supports bearings 17. Each of said bearings 80 has an integrally formed stud 86 which radially projects from said bearing 80 and which normally rests upon the longer free end of lever 84, and at an incline or obliquely thereto as is seen in full lines in Figs. 1 and 2, for the purpose hereinafter described.

Keyed to one end of shaft 76 is bar 87, the opposite end of which is pivotally connected as at 88 to the bifurcated end 89, which is affixed to the upper end of rod 90. The latter rod is integrally formed with stop 91 and core 92. Said

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core 92 is positioned centrally of solenoid 71 and is adapted for vertical shifting movement there-within. As is obvious, when said solenoid is energized when the electric circuit, shown in Fig. 6, is completed through contacting contacts 54 and 68, said core 92, due to the magnetic action of said solenoid 71, will be caused to shift downwardly, shifting therewith rod 90 for angular shifting movement of bar 87 for rocking shaft 76. Stop 91 constitutes means for limiting the maximum shifting movement of said core 92, as the former comes in contact with the upper end of solenoid 71.

The shifting movement of said bar 87, as aforesaid, will cause rotary movement of gears 77, which in turn will impart rotation to pinions 79 and their bearings 80 into opposite direction, effecting in turn angular shifting movement of studs 86 from their inclined, oblique position to the vertical position indicated by dotted lines in Fig. 1. This angular shifting movement of studs 86 will exert downward pressure upon the outer ends of levers 84 for shifting the same upon their pivots 83, for elevating the inner ends of said levers 84, including their extensions 85, for actuating bearings 17 in an upward direction, and against the tension of springs 24, and to the position indicated by dotted lines in Fig. 1. The upward shifting movement of said bearings 17 will simultaneously shift bodily shaft 25 and roller 26, but will not disconnect gears 27, the latter continuing in engagement by their teeth, because the elevation of bearings 17 and roller 26 is only to a fraction of an inch not sufficient to disengage teeth in the two gears 27.

The upward shifting movement of bearings 17 by levers 84 is effectuated against the tension of springs 24, sockets 23 being of course deeper than the reduced lower ends 22 of said cylindrical bars 21 permitting upward shifting of bearings 17. When however studs 86 release the pressure upon levers 84, from the position shown in dotted lines in Fig. 1, springs 24, exerting tension upon the upper ends of bearings 17, bring the same back to normal position, with roller 26. It is observed however, that levers 84 are actuated for elevating bearings 17 for separating roller 26 from roller 15 only at the time when solenoid 71 is energized, and then only when contacts 54 and 68 have directly been brought together. However, as long as paper is fed to rollers 15 and 26, the same acts as insulation between said contacts 54 and 68, preventing completion of the electric circuit. It is only when the paper ceases to be fed to said rollers 15 and 26 that gap between contacts 54 and 68 is removed to bring them directly together for completing electric circuit to energize solenoid 71 and thereby to actuate shifting of levers 84 for separating the two rollers.

From the hereinabove description it will be seen that when paper ceases to be fed towards rollers 15 and 26 and electric circuit is completed to energize solenoid 71, due to the action of cam 28 on bar 30, roller 26 is raised upwardly and separated from roller 15 by the action of levers 84 upon bearings 17. Ordinarily such separation would continue only for a brief period of time, equivalent to the time required for riser 29 to pass past idler 31. Measured in terms of the revolution of roller 26, that interval during which said roller 26 would remain raised and separated from roller 15, would be equivalent to a fraction of the revolution of said roller 26, and during the remainder of its revolution, said roller 26 would remain in contact with roller 15. To

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obviate this result, and to bring about a longer separation of roller 26 from roller 15 during each revolution of said roller 26, and consequently to bring about contact between the two rollers during each revolution thereof, and for a brief period of time, so as to condition said rollers to grasp paper as the same is fed therebetween anew, suitable mechanism, best shown in Figs. 2 and 3 is provided. That mechanism includes support 93 affixed in any suitable manner to the outer face of one of standards 11. Hingedly connected by pivot 94 to the outer end of support 93 is a vertically disposed bar 95, having at its lower end and above support 93 a regulating screw 96 passing through said bar 95 and bearing against stop 97 upwardly extending from said support 93. Said screw 96 and stop 97 regulate or limit the maximum degree of shifting of said bar 95 towards standard 11. Coil spring 98 affixed to plate 19 and pin 99, the latter extending from the upper end of said bar 95, normally urges said bar 95 towards standard 11. Substantially in its central portion said bar 95 has a transverse recess 100 made therein at a point which is substantially in alinement with the lowermost position of bar 87 when the latter is brought to that position by the action of solenoid 71 as hereinabove described. As soon as bar 87 is shifted to its lowermost position and comes in alinement with recess 100, by virtue of the action of spring 98 upon bar 95, bar 87 finds itself within recess 100 and thereby is locked to said bar 95, the position illustrated by dotted lines in Fig. 3.

Coil spring 101 attached to standard 11 and bar 87 normally maintains said bar 87 in its inoperative elevated position, shown in full lines in Fig. 2, and brings the same to that latter position when solenoid 71 has been de-energized.

Affixed to the outer adjacent end of shaft 25 is wheel 102 carrying upon its face cam lug 103, which is positioned adjacent the rim of said wheel 102, and which, by its inclined face, rides upon the inner edge of bar 95, and adjacent the upper end of the latter, as said wheel 102 rotates, for the purpose of tripping said bar 95 and of shifting the same against the tension of spring 98, for freeing bar 87 from its locked engagement by bar 95 and from its recess 100. Once said recess 100 is brought out of the path of the upright shifting movement of bar 87, by action of cam lug 103, as it strikes the upper end of bar 95, said bar 87 automatically shifts upwardly due to the action of spring 101, and brings said bar to its inoperative position shown in full lines in Figs. 2 and 3.

The action of cam lug 103 upon bar 95 to release the same from its engagement with bar 87, is timed with the action of cam 28 upon bar 30. When the electric circuit has been completed through contacts 54 and 68, in the absence of the paper therebetween, and solenoid 71 is energized with bar 87 shifted downwardly to the position indicated by dotted lines in Figs. 2 and 3 and against the tension of spring 101, roller 26 becomes elevated and separated from roller 15. At that very instant when said bar 87 has been brought to its downwardly shifted position, bar 95 instantaneously engages the same as hereinabove described. At that moment cam lug 103 remains in a position past said bar 95. Therefore the engagement between bars 95 and 87 will continue during almost entire revolution of wheel 102 and thereby of roller 26, until wheel 102 completes its revolution and cam lug 103 is brought

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in contact with bar 95 to deflect the same from its engagement with bar 87. When this action takes place bar 87 instantaneously shifts upwardly by action of spring 101, thereby actuating levers 84 to release their hold upon bearings 17 for shifting the same downwardly and thereby bringing roller 26 in contact with roller 15. This contact between the two rollers is of comparatively brief duration, during each revolution of rollers 15 and 26, and continues only until rise 29 of cam 28 is again in contact with idler 31 to shift contact 54 towards contact 68 for completing electric circuit and energizing solenoid 71. It will therefore be seen that in the absence of paper between contacts 54 and 68 action of rise 29 upon idler 31 brings about the completion of the electric circuit and energizing of solenoid 71, by shifting contact 54 in contact with contact 68, which action takes place once during each revolution of roller 15, and thereby once during each revolution of roller 26. Action of bar 95 upon bar 87 maintains roller 26 in a separated relation with roller 15 during the major portion of the rotation of said rollers and cam lug 103 releases the engagement between said bars 95 and 87 once during each revolution of said rollers 15 and 26, thereby bringing about contact between said rollers once during each revolution thereof. The action of rise 29 upon idler 31 is of course timed with the action of said cam lug 103 upon bar 95, namely when cam lug 103 strikes bar 95 rise 29 is out of contact with idler 31.

From the hereinabove description it will be seen that when no paper is fed towards rollers 15 and 26, said roller 26 is separated from roller 15 during the major portion during each single revolution, with roller 26 brought in contact with roller 15 for a brief interval of time during each revolution of said rollers, for the purpose of conditioning the two rollers for grasping the paper when the same commences to be fed therebetween anew. It follows that in the absence of paper shifted between contacts 54 and 68 bar 87 is shifted downwardly and into a locked engagement with bar 95 by the action of rise 29 upon idler 31, also once during each revolution of rollers 15 and 26. However, said bar 87 is maintained in a downwardly shifted position and in locked engagement with bar 95, not by virtue of solenoid 71 and consequently not by virtue of action of rise 29 upon idler 31, but by virtue of the action of spring 98 in maintaining said bar 95 in engagement with said bar 87. This engagement continues almost through the entire single revolution of roller 26 when the latter is in an elevated position and separated from roller 15. It is only during a brief period of time during each single revolution of roller 26 that the same is brought in contact with roller 15, and that contact between the two rollers is brought about by the action of cam lug 103 upon bar 95 for releasing the same from engagement with bar 87 and for permitting said bar 87 to shift upwardly due to the action of spring 101. As stated, when bar 87 shifts upwardly and out of engagement with bar 95, solenoid 71 remains de-energized, because at that particular moment rise 29 of cam 28 is out of engagement with idler 31, and therefore contacts 54 and 68 are not in contacting position.

From the hereinabove description it will be seen that by the action of cam 28 upon bar 30, by the action of spring 101, as well as by the action of bar 95 and cam lug 103, bar 87 is intermittently angularly shifted, downwardly during

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the major portion of each revolution of rollers 15 and 26, and upwardly during a brief period of the revolution of the said rollers, for the purpose of bringing roller 26 in contact with roller 15 for a short interval of time during each revolution of said rollers, all in the absence of a paper sheet between the contacts 54 and 68.

As hereinabove stated the teeth of gear wheels 27 are at all times in mesh, regardless whether rollers 15 and 26 are in contact or not, thereby transmitting constant rotation to roller 26 as well as to wheel 102.

While there is described herein a preferred embodiment of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What I claim as new is:

1. In a printing machine having a pair of printing rollers, towards and between which a paper sheet is fed, said rollers being set upon shafts, means for separating the rollers in the absence of paper sheet comprising a pair of contacts positioned in the path of the paper sheet as the same is shifting towards said rollers, a bar supported upon one of said shafts, a cam carried by one of said shafts for intermittently shifting said bar, a rocker shaft, a rod connected with said rocker shaft, one of said contacts being carried by said rod, said bar and said rocker shaft being connected for imparting rocking movement to the contact carried thereby for moving the same to or away from the other of said contacts by the action of said cam on said bar, a solenoid, said solenoid and said contacts being connected in an electric circuit for energizing said solenoid when said contacts come together in the absence of paper sheet therebetween, and means associated with the second-mentioned shaft and actuated by said solenoid when energized for causing shifting of the other of said rollers by the action of the solenoid away from the first of said rollers.

2. In a printing machine, a pair of standards, a roller set by its shaft within said standards for rotary movement, bearings positioned within said standards for shifting to or away from said roller, a shaft journaled within said bearings, another roller set upon said shaft, the two rollers normally contacting for continuously receiving sheet of paper therebetween, a pair of contacts positioned in the path of paper as it shifts towards said rollers, a solenoid, said electric contacts and said solenoid being connected in an electric circuit, means operated by the first-mentioned shaft for intermittently bringing said contacts to or away from each other, in the absence of paper sheet said contacts being adapted to complete an electric circuit when brought together for the purpose of energizing said solenoid, and means associated with the second-mentioned shaft and operable by said solenoid when energized for causing shifting of said bearings away from said first named roller by the action of the solenoid for separating the two rollers.

3. In a printing machine, a pair of standards, a roller set by its shaft within said standards for rotary movement, bearings positioned within said standards for shifting to or away from said roller, a shaft journaled within said bearings, another roller set upon said shaft, the two rollers normally contacting for continuously receiving sheet of paper therebetween, a pair of contacts positioned in the path of paper as it shifts towards said rollers, a solenoid, said electric contacts and said

solenoid being on an electric circuit, means for intermittently bringing said contacts to or away from each other, a lever pivoted within each of said standards, by its inner end said lever contacting with each of said bearings, in the absence of paper sheet said contacts being adapted to complete an electric circuit for energizing said solenoid, and means actuated by said solenoid when energized and associated with the opposite end of each of said levers for angularly shifting said levers by the action of the solenoid for shifting said bearings away from said first named roller for separating the two rollers.

4. In a printing machine, a pair of rollers, towards and between which a paper sheet is fed, a pair of contacts in the path of the paper as the same shifts towards said rollers, means for intermittently shifting said contacts to or away from each other, once during each revolution of said rollers, a solenoid, said solenoid and said contacts being connected in an electric circuit, in the absence of paper sheet between said contacts said solenoid being adapted to be energized when said contacts are brought together, a pair of bearings within which the shaft of one of the said rollers is journaled, said bearings being adapted to shift to or away from the other of said rollers, a lever contacting said bearings for normally maintaining said rollers in contact with each other, a bar in association with said lever and in contact with said solenoid, said bar being adapted for shifting movement by the action of said solenoid when energized for actuating said lever for shifting said bearings away from said first named roller for separating the same, and means operable independently of said solenoid for maintaining said bar in its shifted operative position during the major portion of the revolution of said rollers.

5. In a printing machine, a pair of rollers, towards and between which a paper sheet is fed, a pair of contacts in the path of the paper as the same shifts towards said rollers, means for intermittently shifting said contacts to or away from each other, once during each revolution of said rollers, a solenoid, said solenoid and said contacts being connected in an electric circuit, in the absence of paper sheet between said contacts said solenoid being adapted to be energized when said contacts are brought together, a pair of bearings within which the shaft of one of the said rollers is journaled, said bearings being adapted to shift to or away from the other of said rollers, a lever contacting said bearings for normally maintaining said rollers in contact with each other, a bar in association with said lever and in contact with said solenoid, said bar being adapted for shifting movement by the action of said solenoid when energized for actuating said lever for shifting said bearings away from said first named roller for separating the same, and means operable independently of said solenoid for maintaining said bar in its shifted operative position during the major portion of the revolution of said rollers, said last named means including a locking bar engaging said first named bar when the same is in a shifted operative position when brought to that position by said solenoid when energized, said locking bar engaging said first named bar during the major portion of the revolution of said rollers, and a cam device for disengaging said locking bar from said first named bar, said cam device being operable once during each revolution of said rollers.

6. In a printing machine, the combination of a pair of printing rollers adapted to receive a

paper sheet therebetween, shafts mounting said rollers, means mounting one of said shafts for bodily movement of the roller thereon toward and from the coacting roller on the other shaft and including bearings and levers pivotally mounted and supporting the bearings thereon for bodily shifting movement upon swinging action of said levers, electrically operated means operatively connected with said levers and causing shifting of the levers by the action of the electrically operated means to cause a shifting movement of said first-mentioned roller, electric circuit closing devices connected with said electrically operated means for energizing said means upon the failure of feeding of a paper sheet to the rollers, and means actuated by the second-mentioned shaft for operating said circuit closing devices.

7. In a printing machine, the combination of a pair of printing rollers adapted to receive a paper sheet therebetween, shafts mounting said rollers, means mounting one of said shafts for bodily movement of the roller thereon toward and from the coacting roller on the other shaft and including bearings and levers pivotally mounted and supporting the bearings thereon for bodily shifting movement upon swinging action of said levers, means including a solenoid for operating said levers to cause separating action of said first-mentioned roller, a pair of electric contacts arranged in the path of feeding of the sheet and connected in an electric circuit with the solenoid for controlling the action of said solenoid, and means actuated by the second-mentioned shaft for causing relative closing movement of the contacts to close the circuit to the solenoid in the absence of a paper sheet between the contacts.

8. In a printing machine, the combination of a pair of coacting printing rollers adapted for the feeding of a paper sheet therebetween, shafts mounting said rollers, means mounting one of said shafts for bodily movement of the roller thereon relative to the roller on the other shaft in separating action, and means for causing movement of said mounting means for relative separation of the rollers including electrically actuated means for causing relative shifting of the rollers by actuation of said electrical means, a pair of contacts positioned in the path of the paper sheet and electrically connected with said electrically actuated means, an arm supporting one of said contacts for movement toward and from the other, supporting means for said arm for causing rocking movement thereof, and means for operating said arm including a rod mounted for longitudinal movement, and a cam mounted on the second-mentioned shaft and having operative relation with said rod for actuating the rod to cause circuit closing movement of the contacts in the absence of a paper sheet therebetween.

9. In a printing machine, the combination of a pair of printing rollers adapted to receive a paper sheet therebetween, shafts mounting said rollers, means mounting one of said shafts for bodily movement of the roller thereon toward and from the coacting roller on the other shaft and including bearings and levers pivotally mounted and supporting the bearings thereon for bodily shifting movement upon swinging action of said levers, means including a solenoid for operating said levers to cause separating action of said first-mentioned roller, a pair of electric contacts arranged in the path of feeding of the sheet and connected in an electric circuit with the solenoid

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for controlling the action of said solenoid, an arm supporting one of said contacts for movement toward and from the other contact, supporting means for said arm for causing rocking movement thereof, and means for operating said arm and actuated by the second-mentioned shaft to cause circuit closing movement of the contacts in the absence of a paper sheet therewith.

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