May 1, 1956 C. WEBER ET AL 2,743,671

SHEET TRIPPED ENDORSING MACHINE

Filed June 27, 1951 4 Sheets-Sheet 1

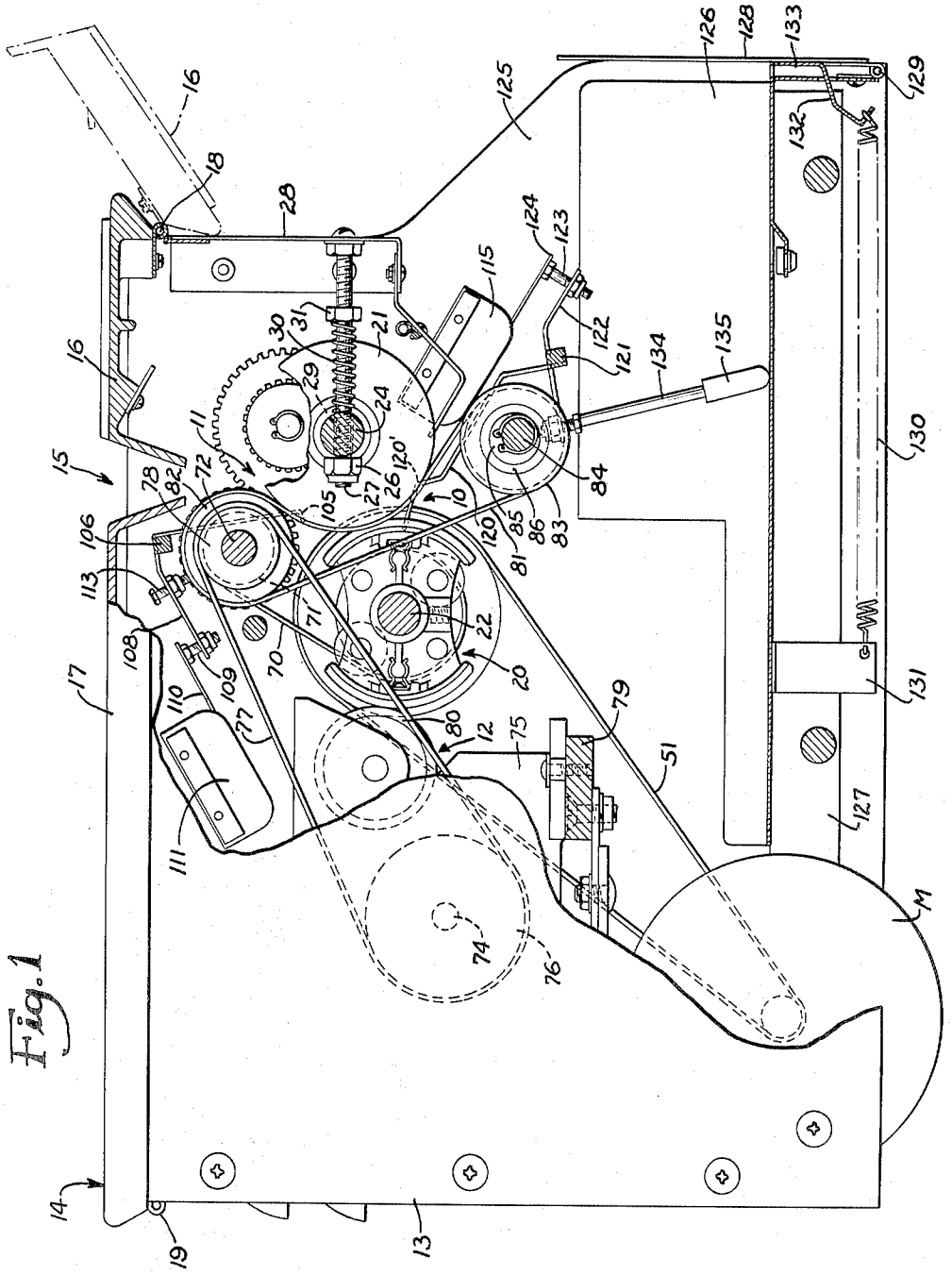


Fig. 1

Inventors
Carl Weber
Otto D. Doerner
William G. Mantonya
Ernest H. Doerner
by: Cahill, Putzel, Hulbert & Wolf
Attys.

May 1, 1956 C. WEBER ET AL 2,743,671

SHEET TRIPPED ENDORSING MACHINE

Filed June 27, 1951 4 Sheets-Sheet 2

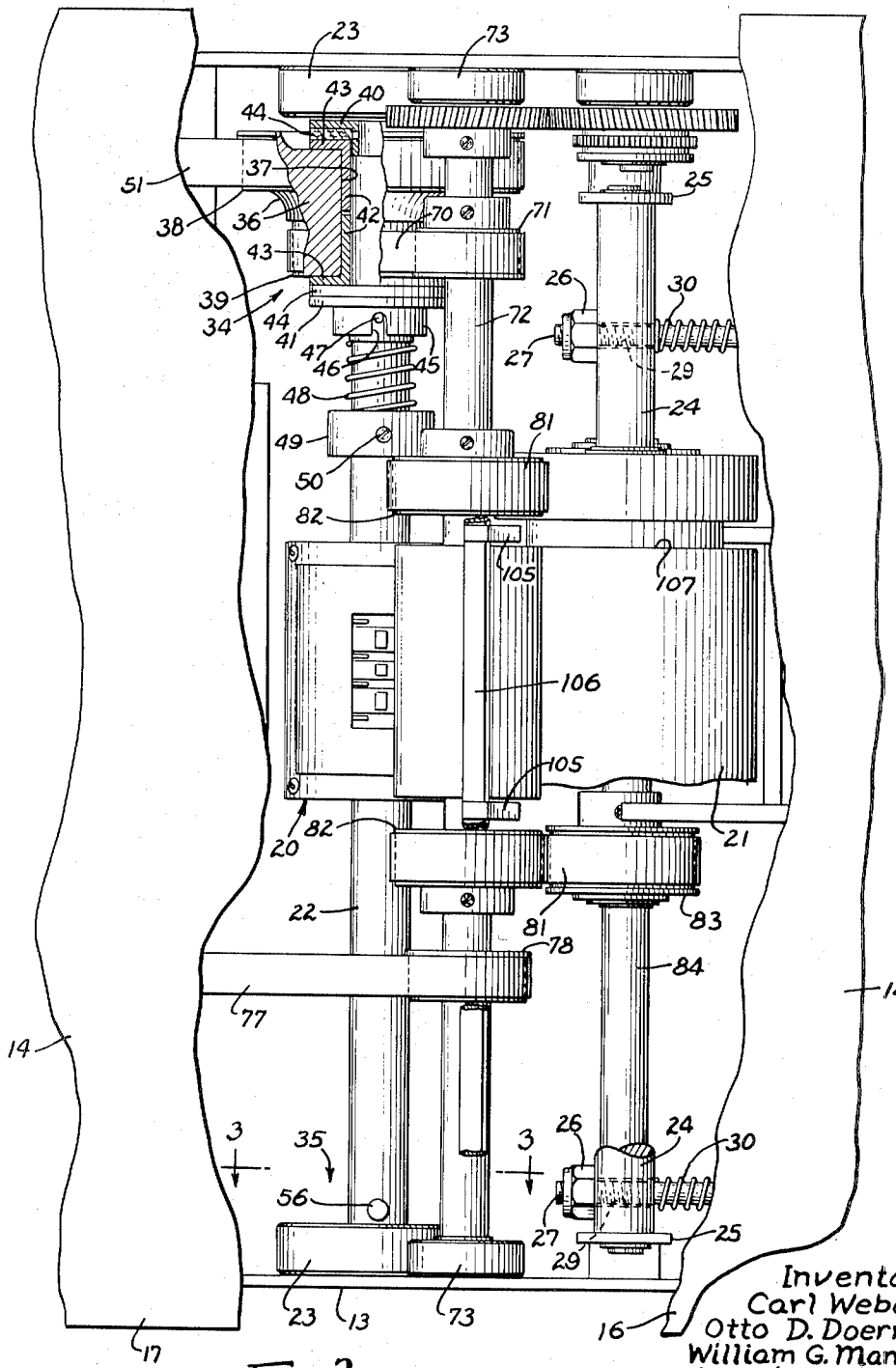


Fig. 2

Inventors
Carl Weber
Otto D. Doerner
William G. Mantonya
Ernest H. Doerner

by: Cadwalader, Gickner, Hubbard & Wolf.
Attys

May 1, 1956 C. WEBER ET AL 2,743,671

SHEET TRIPPED ENDORSING MACHINE

Filed June 27, 1951 4 Sheets-Sheet 3

Fig. 3

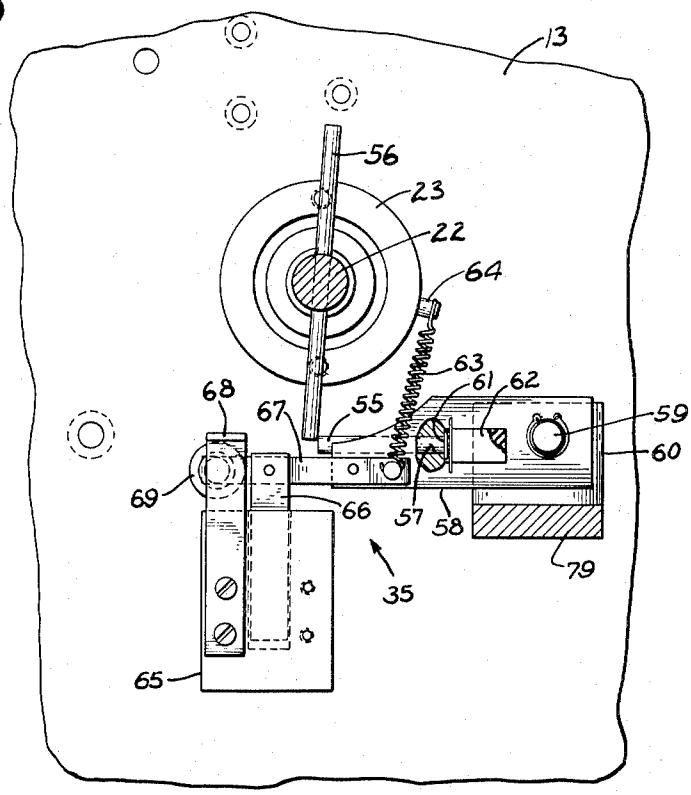
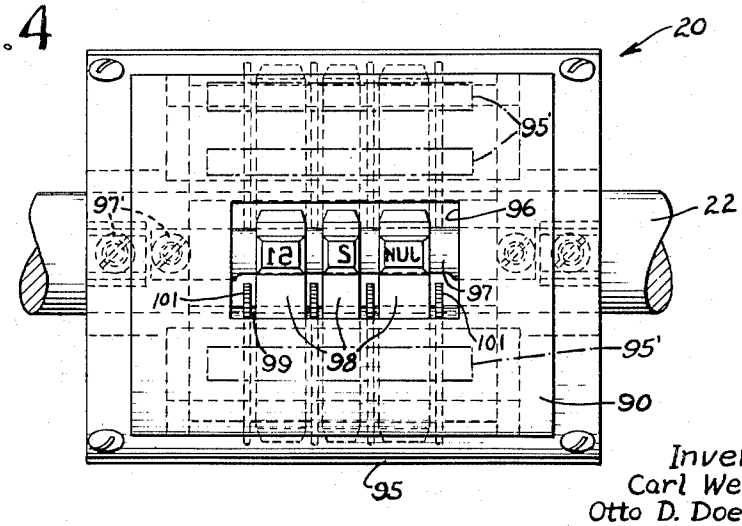


Fig. 4



Inventors
Carl Weber
Otto D. Doerner
William G. Mantonya
Ernest H. Doerner

By [illegible]
Attys

May 1, 1956 C. WEBER ET AL 2,743,671

SHEET TRIPPED ENDORSING MACHINE

Filed June 27, 1951 4 Sheets-Sheet 4

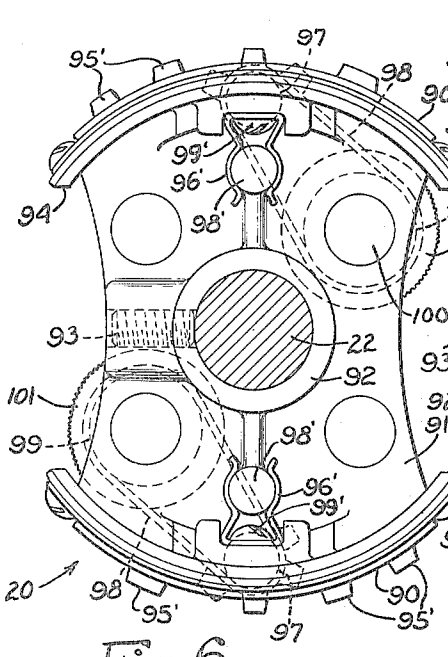


Fig. 6

Fig. 5

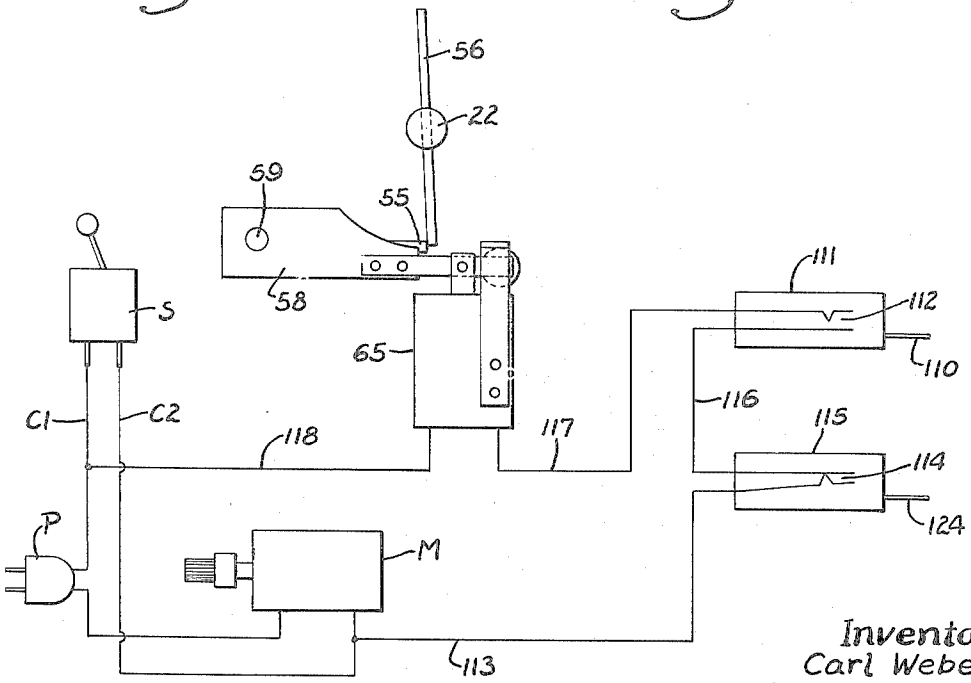


Fig. 7

Inventors
Carl Weber
Otto D. Doerner
William G. Mantonya
Ernest H. Doerner

By Carlson, Price, Hutchison, Wolfe & Atty's.

United States Patent Office

2,743,671

Patented May 1, 1956

2,743,671

SHEET TRIPPED ENDORSING MACHINE

Carl Weber, Otto D. Doerner, William G. Mantonya, and Ernst H. Doerner, Chicago, Ill., assignors to Cummins-Chicago Corp., Chicago, Ill., a corporation of Illinois

Application June 27, 1951, Serial No. 233,816

5 Claims. (Cl. 101—235)

The invention relates to machines for endorsing, cancelling or otherwise printing upon bank checks or other paper sheets, and it is more particularly concerned with machines of the type in which printing is effected by means of a printing couple including a die carrying cylinder or printing drum which is rotated intermittently as successive checks are presented thereto.

A general object of the invention is to increase the operating speed of machines of the above general character and at the same time to provide smoother and quieter operation.

Another object is to provide improved means whereby the intermittent starting and stopping of a high speed printing cylinder may be effected with a minimum of vibration and noise.

Still another object is to provide improved means for coordinating the feeding of the checks with the rotation of the printing drum so as to insure accurate register of the printed indicia on successive checks, or in other words, to locate the printed impression in precisely the same position on each check.

A further object is to provide improved controls which effectively limit the printing drum to a single operating cycle in each passage of a check through the machine irrespective of the width of the check.

It is also an object of the invention to provide a rotary drum printing machine of simple rugged construction which is efficient, fast and reliable in operation and which permits quick and easy change of the printed matter.

Other objects and advantages of the invention will become apparent from the following detailed description of the preferred embodiment illustrated in the accompanying drawings, in which:

Figure 1 is a partly sectioned side view of a check indorsing and signing machine embodying the features of the invention.

Fig. 2 is a plan view of the machine with a part of the top cover broken away to show details of the printing and drive mechanisms.

Fig. 3 is a fragmentary sectional view taken in a plane substantially on the line 3—3 of Fig. 2.

Fig. 4 is a top view of the printing drum.

Fig. 5 is a side view of the printing drum.

Fig. 6 is an end view of the printing drum, and

Fig. 7 is a diagram of the operating circuit of the machine.

While the invention is susceptible of various modifications and alternative constructions, there is shown in the drawings and will herein be described in detail the preferred embodiment, but it is to be understood that it is not thereby intended to limit the invention to the form disclosed, but it is intended to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

For purposes of illustration, the invention has been shown as embodied in a machine for printing endorsements on the backs of bank checks. The operating

mechanism of the machine including a printing couple 10, feed mechanism 11, inking mechanism 12, a driving motor M, together with suitable controls, are compactly arranged in and enclosed by a metal housing 13. The housing is closed at the top by a cover plate 14 provided with a transverse slot 15 through which the checks to be endorsed may be presented manually to the printing couple. In the exemplary machine the cover plate 14 is divided transversely adjacent the slot 15 into front and rear sections 16 and 17 hinged respectively at 18 and 19 to the front and rear walls of the housing. The front section 16 may thus be swung to the open position in which it is shown in broken lines in Fig. 1, to accommodate the installation of an automatic check feeder, various types of which are available for use with machines of the type under consideration.

The printing couple 10 in its preferred form comprises an intermittently or cyclically rotatable die carrying cylinder or printing drum 20 and a cooperating platen or impression roll 21 which may be rotated continuously. As shown in Figs. 1 and 2, the drum 20 is pinned or otherwise non-rotatably secured on a transverse shaft 22 journaled at opposite ends in anti-friction bearings 23 carried on the side walls of the housing 13. The impression roll 21 is rotatably mounted on a shaft 24 supported in parallel relation to the shaft 22 by arms 25 (Fig. 2) mounted on the side walls of the housing 13 so that the shaft and impression roll can swing as a unit toward and from the drum. The limit position of such movement toward the printing drum is determined by suitable stop means, herein shown as stop nuts 26 threaded on rods 27 which are anchored at one end in the front end wall 28 of the housing and which extend through clearance holes 29 in the shaft 24. A compression spring 30 is coiled around each of the rods 27 so as to bear at one end against the shaft 24 and at the other end against a nut 31 threaded on the rod. The springs thus serve to yieldably urge the impression roll 21 into operative relation with respect to the printing drum 20.

To insure quick starting and smooth shockless stopping of the printing drum 20 in each operating cycle of the machine, the drive for the drum is effected through the medium of a friction clutch mechanism 34 under control of a novel trip mechanism 35. As shown in Fig. 2, the clutch mechanism 34 comprises a cylindrical member 36 having a central bore 37 and two axially spaced pulley grooves 38 and 39. That is to say, the member 36 constitutes a double pulley and, in the present instance, it is rotatably mounted on one end of the shaft 22 between spaced friction disks 40 and 41 non-rotatably secured to the shaft. The member 36 is rotatably supported on the shaft by means of a pair of sleeve bearings 42 pressed into the bore 37 or otherwise secured to the member for rotation as a unit therewith. Each of the sleeve bearings is formed at its outer end with a flange 43 overlying the end of the member and presenting opposed annular bearing surfaces for cooperation with the friction disks 40 and 41. Friction washers 44 of felt or other suitable material are interposed between the bearing surfaces and the respective friction disks.

To maintain effective frictional driving engagement between the disks 40 and 41 and the flanges 43, the disk 41 is mounted on the shaft 22 for limited movement axially thereof. To this end the disk 41 is formed with an integral hub portion 45 having an axially disposed slot 46 for the reception of a pin 47 by which the disk is constrained to rotate with the shaft. A compression spring 48 interposed between the hub portion 45 of the disk and a collar 49 fixed to the shaft as by a set screw 50 urges the disk toward the friction surfaces of the flanges 43. The force imposed on the disk may be adjusted by shifting the collar 49 along the shaft.

In the exemplary machine the member 36 is driven continuously by the motor M through the medium of a belt 51 running in the pulley groove 38. The member when rotated applies torque to the shaft 22 through the friction clutch mechanism above described effective to rotate the shaft and printing drum 20 unless the shaft is positively held against rotation.

Intermittent rotation of the shaft 22 and printing drum 20 is controlled by a novel trip mechanism which is positive in operation and which effectively minimizes shock and noise incident to stopping the rapidly rotating shaft and drum assembly. Referring to Fig. 3 of the drawings, the improved trip mechanism comprises a stop pawl 55 normally positioned to cooperate with a radially projecting cam bar 56 secured to and rotatable with the shaft 22 to interrupt rotation of the shaft. The pawl, of course, is retractable to free the shaft for rotation by the friction clutch above described.

Stop pawl 55 may conveniently comprise a cylindrical pin mounted within an aperture 57 formed in one end of a mounting block 58 which is pivotally supported adjacent its other end by a pivot pin 59 carried by a bracket 60 on one side wall of the housing 13. The pawl is mounted with one end projecting from the mounting block for engagement with the cam bar 56. At its other or inner end, the pawl is formed with a head 61 adapted to bear against a cushioning element 62 of rubber or other resilient material seated in a recess in the mounting block. This resilient element absorbs the shock resulting from the engagement of the cam bar with the end of the pawl when the latter is interposed in the path of the cam bar. A tension spring 63 connected between the mounting block 58 and a lug 64 fixed to the housing 13 yieldably urges the pawl into blocking position with respect to the cam bar 56. Withdrawal of the stop pawl 55 from the blocking position in which it is shown in Fig. 3 to release the shaft 22 for rotation is effected, in this instance, by means of a solenoid 65 suitably supported on the housing 13. For this purpose the movable core or armature 66 of the solenoid is pivotally connected to an arm 67 secured to and extending beyond the free end of the mounting block 58. Energization of the solenoid is thus effective to rock the mounting block downwardly and thereby withdraw the pawl from stop position. The end of the arm 67 is extended substantially beyond the pivotal connection with the armature 66 and is confined between a stop bracket 68 and the end of the solenoid to define the limit positions to which the mounting block 58 may be rocked. A bumper 69 of rubber or other suitable resilient material is provided on the outer end of the arm 67 to cushion the shock incident to the energization and de-energization of the solenoid and the resulting rapid movement of the mounting block to one or the other of its limit positions. This not only affords smoother operation but eliminates another source of annoying noise.

The friction clutch pulley 36 is additionally utilized to drive the feed mechanism 11 and the inking mechanism 12 of the machine. For this purpose a belt 70 running in the belt groove 39 is run over a pulley 71 (Fig. 1) keyed or otherwise non-rotatably fixed to a transverse shaft 72 rotatably supported at opposite ends by anti-friction bearings 73 carried on the side walls of the housing 13. The inking mechanism 12 which may be of any suitable and well known character includes the usual immersion roll (not shown) carried by a shaft 74 (Fig. 1) so as to run with its lower portion immersed in an inkwell 75. A pulley 76 on the shaft 74 is drivingly connected by a belt 77 with a pulley 78 fast on the shaft 72. As shown in Fig. 1, the inkwell 75 and associated elements are supported at the rear of the printing drum 20 as by supporting bars 79 extending between the side walls of the housing. A transfer roller 80 interposed between the immersion roll and the printing drum serves to transfer ink to the latter in well known manner.

In accordance with the invention, the feed mechanism 11 is constructed and arranged to insure presentation of successive checks to the printing drum in precisely the same position each time so that successive impressions are accurately registered in the same place on all checks. To this end the feed mechanism includes a pair of friction belts 81 each running over a pulley 82 fast on the shaft 72 and over a pulley 83 rotatably mounted on a shaft 84 extending transversely across the housing 13 below the impression roll 21. As will be seen by reference to Fig. 1 of the drawings, the shaft 72 is arranged above and slightly at one side of the impression roll 21 so that one run of each belt 81 has a substantial area of contact with the impression roll. Accordingly, these belts serve to drive the impression roll.

Preferably the pulleys 82 and pulleys 83 are spaced apart axially of their respective shafts so that the belts 81 engage the impression roll adjacent the ends of the roll. Moreover, the upper pulleys 82 are positioned so that a check inserted through the slot 15 in the cover plate or a check presented by an automatic feeder will be gripped between the belts and the impression roll and thus carried past the printing drum 20. The gripping of the check at two longitudinally spaced points effectively prevents presentation of the check for printing in a skewed position. Moreover, slippage between the checks and the feed mechanism is reduced to a minimum so that the check is quickly accelerated to the surface speed of the impression roll which is rotated at approximately the same surface speed as the printing drum. Accurate registration of the printed impression on each check is thus obtained.

Provision is made so that the tension of the feed belts 81 may be quickly and uniformly adjusted for proper operation under all conditions. For this purpose the shaft 84 is fitted with eccentric bushings 85 supporting the pulleys 83. The shaft itself is carried in recessed bearing brackets 86 on the side walls of the housing 13. By rotating the bushings the pulleys 83 may be shifted transaxially toward or from the shaft 72 as required.

An important factor in the adaptation of the instant machine for high speed operation is the construction of the printing drum 20 so as to reduce its inertia to a minimum. To this end, the drum is constructed to accommodate a plurality of similar printing dies and each printing operation is effected in a corresponding fraction of a complete revolution of the drum. In the particular machine illustrated, the drum 20 is constructed and arranged to carry two printing dies 90 and accordingly is rotated through a half revolution in each printing cycle. The trip mechanism 35, of course, is arranged to restrict the rotation of the drum carrying shaft 22 to a half revolution in each cycle and to this end the cam bar 56 is extended diametrically through the shaft 22 and projects equal distances on opposite sides thereof, as shown in Fig. 3.

Referring more particularly to Figs. 4, 5 and 6, the printing drum 20 in its preferred form comprises a skeleton frame including a pair of end members 91. Each end member is formed with a hub portion 92 apertured for the reception of the shaft 22 and secured thereto as by a set screw 93.

The end members 91 are similarly shaped each having two diametrically opposite edge portions formed on radii at the center of the drum. To these edge portions are secured arcuate saddles or base plates 94 which define diametrically opposite segments of a cylindrical surface having its center coincident with the central axis of the frame. Die plates 95 may be secured in any suitable manner to the base plates. The die plates carry the printing dies 90 which may be formed from rubber or other suitable lightweight material with appropriate printing characters or numerals or its outer face as indicated at 95'. The dimensions of the base plates 94 and other parts associated

therewith are held to the minimum required by the printing dies to avoid unnecessary weight.

The printing drum shown is equipped with settable date printing mechanism in addition to the fixed printing dies. This date printing mechanism is characterized by its simplicity and lightweight construction. As shown in the drawings, the date is printed substantially centrally of the impression produced by the fixed die. Accordingly, each die 90 and die plate 95 is formed with central apertures 96 registering with a similar aperture in the base plate 94. Extending across the aperture in the base plate and disposed longitudinally of the drum is a bridging bar 97 over which is threaded a series of endless flexible printing bands 98 each of which passes over an adjusting roll 99 rotatably mounted on a pin 100 extending between the end members 91 of the drum. Spacers 92' at opposite ends of the pin hold the adjusting rolls in centered position.

The bars 97 are secured to the end members 81 as by screws 97' and, in addition to guiding the bands 96, hold the end members together as a unit. The intermediate portion of each bar is offset outwardly as shown in Fig. 5 so as to locate the type characters on the band 98 in the same plane as the type characters 95' on the associated printing die 90.

For adjusting the printing bands 98, each of the rolls 99 is provided with a knurled thumb wheel 101 by which the drum can be rotated and the band thus shifted to locate selected type areas in printing position. As will be seen by reference to Fig. 6, the rolls 99 are located inwardly of and adjacent one edge of the plate 94 so that the thumb wheels 101 are conveniently accessible at the open side of the drum 20. While the printing bands 98 have been shown as equipped with type for printing month, date and year indicia, it will be understood that these bands may be provided with type for printing other indicia if desired.

To facilitate quick changes of the fixed printing dies 90 the die plates 95 and saddle plates 94 are attached to the drum for easy removal. As herein shown, attachment is effected by means of spring clips 96' secured to the saddle plates as by screws 97' and adapted to frictionally grip studs 98' formed on and projecting from the end members 91 as shown in Fig. 6.

The printing drum constructed in accordance with the teachings of the present invention is relatively light in weight and since two separate printing impressions may be made in each revolution of the drum, the inertia of the rotating parts is low. Operations may thus be carried out at high speed without subjecting the machine to excessive strain. This is highly advantageous in affording a high productive rate.

The adjustable printing elements or date printing mechanism provided on the drum 20 may be readily adjusted, since the knurled adjusting wheels 101 associated with the respective printing bands are readily accessible at the open sides of the drum. Furthermore, these open sides of the drum provide clearance for the impression roll when the machine is idle.

As indicated heretofore, certain elements of the machine are driven continuously while others, such as the printing drum, operate intermittently. It will be understood, of course, that by continuous operation is meant the operation when the machine is conditioned for use as when the motor M is running. Operating current may be supplied to the machine by a conventional plug-in connector P and cord C1—C2 in which is interposed an On and Off switch S (Fig. 7). Closure of the switch completes an operating circuit for the motor M and supplies current to the other electrical elements of the machine. Motor M, of course, drives the friction clutch member 36 continuously and likewise the feed shaft 72 and the immersion roll of the inking mechanism.

Each printing cycle of the machine is initiated automatically as an incident to the approach of a check to

printing position. Thus as a check is fed through the slot 15 to the feed mechanism it is gripped between the feed belts 81 and the impression roll 21 and carried generally downwardly between the impression roll and the printing drum. Immediately after being gripped by the feed belts 81, the edge of the check is carried into engagement with a pair of trip fingers 105 (Figs. 1 and 2) carried by a crossbar 106 pivotally supported between the side walls of the housing 13. The end portions of the trip fingers are arranged to extend beyond the front faces of the belts 81 and are received in circumferential grooves 107 formed in the impression roll.

Projecting laterally from the bar 106 is an arm 108 having at its free end a contact screw 109 positioned to cooperate with the movable member 110 of a microswitch 111 having normally open switch contacts 112 (Fig. 7). The arrangement is such that the engagement of the trip fingers 105 by a check rocks the bar 106 and arm 108 so as to close the switch contacts 112. An adjusting screw 113 provided on the arm 108 permits accurate adjustment of the trip action.

Closure of the switch contacts 112 completes an energizing circuit for the solenoid 65 from cord conductor C2, conductor 113 normally closed, switch contacts 114 of a microswitch 115, conductor 116, switch contacts 112, conductor 117, winding of the solenoid, and conductor 118 to cord conductor C1. Solenoid 65 upon energizing retracts the stop pawl 55 as previously explained, thus releasing the cam bar 56 so that the shaft 22 may be rotated by the friction clutch mechanism 34. Due to the low inertia of the rotating parts, the printing drum is rapidly brought to full operating speed, that is, to approximately the same surface speed as the impression roll, and the printing die is impressed against the back of the check as it is carried along by the feed belts 81.

To insure stopping of the printing drum at the end of a half revolution, provision is made for opening the solenoid circuit immediately after the leading edge of the check emerges from the printing position, that is, from between the printing drum and the impression roll. For this purpose one or more trip fingers 120 are positioned in the path of the check for engagement thereby while the check is still gripped between the belts 81 and the impression roll 21. As shown in Fig. 1, each of the trip fingers 120 comprises an elongated metal strip having its end portion offset to form a paper engaging tip 120' adapted to ride in one of the grooves 107 in the impression roll. The trip arms 120 are mounted on a crossbar 121 pivotally supported between the side walls of the housing 13. An operating arm 122 projecting laterally from the bar 121 is provided with a contact screw 123 coacting with a movable member 124 of the microswitch 115 to open the switch contacts 115 incident to the engagement of the trip arms 120 by the check. Opening of the switch contacts 114 interrupts the circuit for the solenoid 65 which becomes de-energized and releases the stop pawl 55 for return to blocking position by the spring 63. Accordingly, as the shaft 22 completes its half revolution the cam bar 56 engages the stop pawl and interrupts further rotation.

The provision of the check operated switch 114 in the solenoid circuit as above described, is further advantageous in insuring against reoperation of the printing drum while a check being printed is still gripped by the feed mechanism. More particularly, the trip arms 120 are positioned so that the switch 114 is held open until the trailing edge of the check has emerged from between the printing drum and the impression roll and has passed the tip portions of the arms. Thus, regardless of the width of the check, only one printing impression may be made thereon and the mechanism is only reactuated for the next printing operation as an incident to the presentation of the succeeding check.

The printed or endorsed checks after leaving the print-

ing position are carried forward by the feed mechanism into a chamber 125 in the lower forward portion of the housing 13. In the particular construction illustrated in Fig. 1, such checks are deposited in a drawer or tray 126 slidably supported in the chamber 125 by guide bars 127 for movement into and out of the housing. The drawer as shown is provided with a front wall 128 hinged to the drawer structure as at 129 so that it may be tilted forwardly for convenient removal of the deposited checks. A spring 130 connected between a lug 131 depending from the bottom of the drawer and a lug 132 struck out from a cross piece 133 carrying the front wall member 126 holds the latter in the upright or closed position in which it is shown in Fig. 1.

To insure proper stacking of the checks in the drawer 126 without interfering with the in and out movements of the drawer, a series of guide fingers 134 are arranged between the shaft 84 and the bottom of the drawer. These fingers may be secured to the shaft 84 in any suitable manner and are provided at their lower ends with yieldable tips 135 adapted to slide on the bottom of the drawer.

The machine is placed in operation by throwing the switch S to the "on" position, thus starting the motor M. With motor M running the clutch and double pulley member 36 is continuously driven and, in turn, drives the inking mechanism 12 and the shaft 72 carrying the pulleys over which the feed belts 81 operate. These belts drive the impression roll 21. As each check is presented to the machine either manually through the slot 15 or by an automatic feeder supported on the cover section 16, the leading edge of the check is gripped between the belts 81 and the surface of the impression roll 21. The two belts provided grip the check securely at longitudinally spaced points and carry it downwardly in accurate alinement with the axis of the printing drum. Acceleration of the check to the surface speed of the impression roll is effected rapidly and without the difficulties encountered when separate sets of feed rolls are employed as is customary in machines of this character.

In its advance by the feed mechanism, the leading edge of the check engages the trip arms 105 to close the microswitch 112 which completes a circuit for the solenoid 65. The solenoid becomes energized and withdraws the stop pawl 55. Printing drum 20 is thus released for rotation by the friction clutch mechanism 34. As the drum and associated parts are light in weight, the drum accelerates rapidly to the same surface speed as the impression roll 21 and the printing die 90 is impressed against the back of the check without slippage so as to produce a clear sharp impression.

As the leading edge of the check emerges from printing position it engages the tips 120' of the trip fingers 120 and opens the microswitch 114 to interrupt the circuit for the solenoid 65. The solenoid becomes deenergized and releases the stop pawl 55 for return to stop position by the spring 63. This release and return of the stop pawl is timed to occur before the shaft 22 completes half a revolution so that the projecting end of the cam bar 56 will engage the pawl and thus interrupt rotation of the shaft upon completion of the half revolution. The shock incident to the engagement of the cam bar with the pawl is effectively absorbed without vibration or noise by the resilient block 62.

Since the trip finger 120 is engaged and held in switch opening position by the check until its trailing edge has passed the tip 120', recycling of the printing drum is prevented until complete emergence of the check from printing position. If, in the meantime, a succeeding check has engaged the trip finger 105, a new printing cycle will be initiated immediately upon closure of the switch 114.

The printed checks are discharged by the feed mechanism 11 into the compartment 125 in the machine housing and are stacked successively in the drawer 126. This drawer may be withdrawn from the housing when the checks are to be removed and such removal is facilitated by the forward tilting of the door 128.

It will be apparent from the foregoing that the invention provides a machine for endorsing, cancelling or otherwise printing on checks and similar discreet sheets of paper which is characterized by its high operating speed and its smooth quiet operation. High speed cyclic operation or intermittent starting and stopping of the printing drum is effected very smoothly with a minimum of vibration and with substantially no noise. Moreover, the checks are invariably presented in printing position in proper alinement with the printing drum and in a manner which insures accurate registration of the impressions on successive checks. Double or repeated printing on the same check is effectively avoided even though the checks may vary substantially in width.

We claim as our invention:

1. In a check endorsing machine, in combination, an intermittently rotatable printing drum, a continuously rotating impression roll mounted in opposed relation to said drum, continuously driven feed mechanism for carrying checks through a printing position between said drum and said roll to receive a printed impression from the drum, trip means operable in response to the approach of a check to printing position for initiating the rotation of said drum, other trip means positioned for engagement by the leading edge of the check as it emerges from between the drum and roll and operative upon such engagement to initiate the operation of means for interrupting the rotation of said drum, said other trip means being further operative to prevent reinitiation of the rotation of the drum until the trailing edge of the check emerges from between the drum and roll.

2. In a check endorsing machine, in combination, an intermittently rotatable printing drum, a continuously rotating impression roll mounted in opposed relation to said drum, continuously driven feed mechanism for carrying checks through a printing position between said drum and said roll to receive a printed impression from the drum, a trip finger positioned for engagement by the leading edge of a check as it approaches printing position, a normally open switch closed upon engagement of said trip finger by the check, a second trip finger positioned for engagement by the leading edge of the check upon emerging from printing position, a normally closed switch opened upon engagement of said second trip finger by the check, electrically operated means energized for initiating and deenergized for interrupting the rotation of said drum, and a circuit for said electrically operated means including both of said switches in series.

3. In a check endorsing machine, in combination, a rotatably supported printing drum, an impression roll supported in opposed relation to said drum, a pair of shafts supported in parallel relation to said impression roll respectively at opposite sides thereof, a pair of pulleys carried by each shaft, friction belts trained over a pulley on each shaft with one run in engagement with the surface of said impression roll through a substantial distance circumferentially of the roll, means for continuously driving said belts, said belts driving said impression roll and being operative to grip a check firmly against the roll and carry it past the printing drum, a first set of trip fingers positioned for engagement by the check as it approaches the printing drum, a second set of trip fingers positioned for engagement by the check after passing the printing drum, and a control device actuated by said first set of trip fingers to initiate the rotation of said printing drum and deactuated by said second set of trip fingers to interrupt the rotation of the printing drum at the end of the cycle, said second set of trip fingers preventing reactuation of the control device until the trailing edge of the check passes those fingers.

4. In a check endorsing machine, in combination, a printing drum supported for rotation, a friction clutch including a continuously driven member drivingly associated with said drum, a stop pawl normally positioned to hold said drum against rotation by said clutch member, an impression roll mounted in opposed relation to said drum, check feeding mechanism including a friction belt operating over pulleys located at opposite sides of said rolls, said belt having one run in engagement with a portion of said impression roll and effective to rotate the same when the belt is driven, said belt and said roll serving to grip a check and carry it between the roll and said drum, means connecting said driven clutch member with one of said pulleys to drive said belt, a trip finger having one end disposed in the path along which a check gripped between said belt and said impression roll is advanced toward said drum, switch means operable upon engagement of said trip finger by a check for initiating withdrawal of said pawl to free said drum for rotation by said clutch, a second trip finger positioned for engagement by said check after passing said drum, and other switch means operable by said second trip finger for initiating return of said pawl to drum stopping position.

5. In a machine for printing on a series of paper sheets, the combination of a printing drum carrying a plurality of printing dies, means supporting said drum for rotation, drive means including a friction clutch operative to rotate said drum, stop means including a pawl normally operative to hold said drum against rotation, actuating means operative to withdraw said pawl to release the drum for rotation by said drive means acting through said friction clutch, feed mechanism operative to carry a succession of paper sheets into and out of printing position with relation to said drum, a first trip device operative in the approach to printing position of the leading edge of a sheet carried by said mechanism to initiate the operation of said actuating means, and a second trip device operable in response to the emergence from printing position of the leading edge of the sheet carried by the mechanism to terminate the operation of said actuating means, said second trip device being effective to prevent reoperation of said actuating means until the trailing edge of the sheet has emerged from printing position.

References Cited in the file of this patent

UNITED STATES PATENTS

356,406	Hey et al.	Jan. 18, 1887
378,391	Ethridge	Feb. 21, 1888
388,366	Laass et al.	Aug. 21, 1888
644,525	Lister	Feb. 27, 1900
915,278	Dolphin	Mar. 16, 1909
1,290,509	Chanoler	Jan. 7, 1919
1,429,404	Card	Sept. 19, 1922
1,633,245	Eskholme	June 21, 1927
1,660,472	Booth	Feb. 28, 1928
1,678,589	Differ	July 24, 1928
1,703,148	Ielfield	Feb. 26, 1929
1,871,672	Ellinger	Aug. 16, 1932
1,889,958	Frech et al.	Dec. 6, 1932
1,930,159	Crilly	Oct. 10, 1933
1,947,893	Wheelbarger	Feb. 20, 1934
2,039,566	Swanson	May 5, 1936
2,071,139	Payne	Feb. 16, 1937
2,173,454	Muller	Sept. 19, 1939
2,253,459	Davis	Aug. 19, 1941
2,350,975	Rodder	June 6, 1944