

April 18, 1939.

C. H. BRADT

2,154,604

ROTARY DUPLICATOR

Filed May 7, 1937

3 Sheets-Sheet 1

Fig. 1.

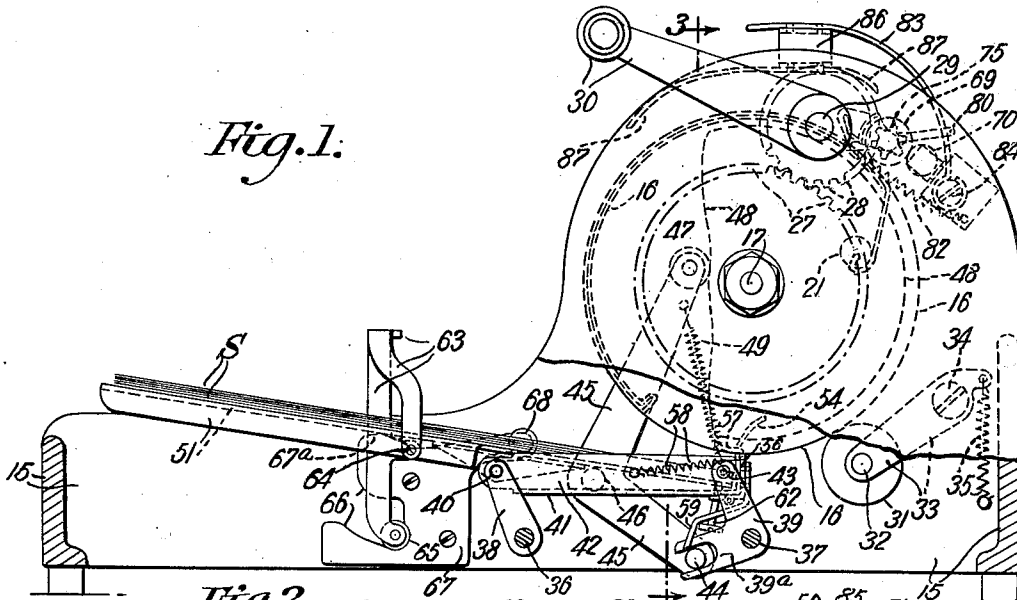
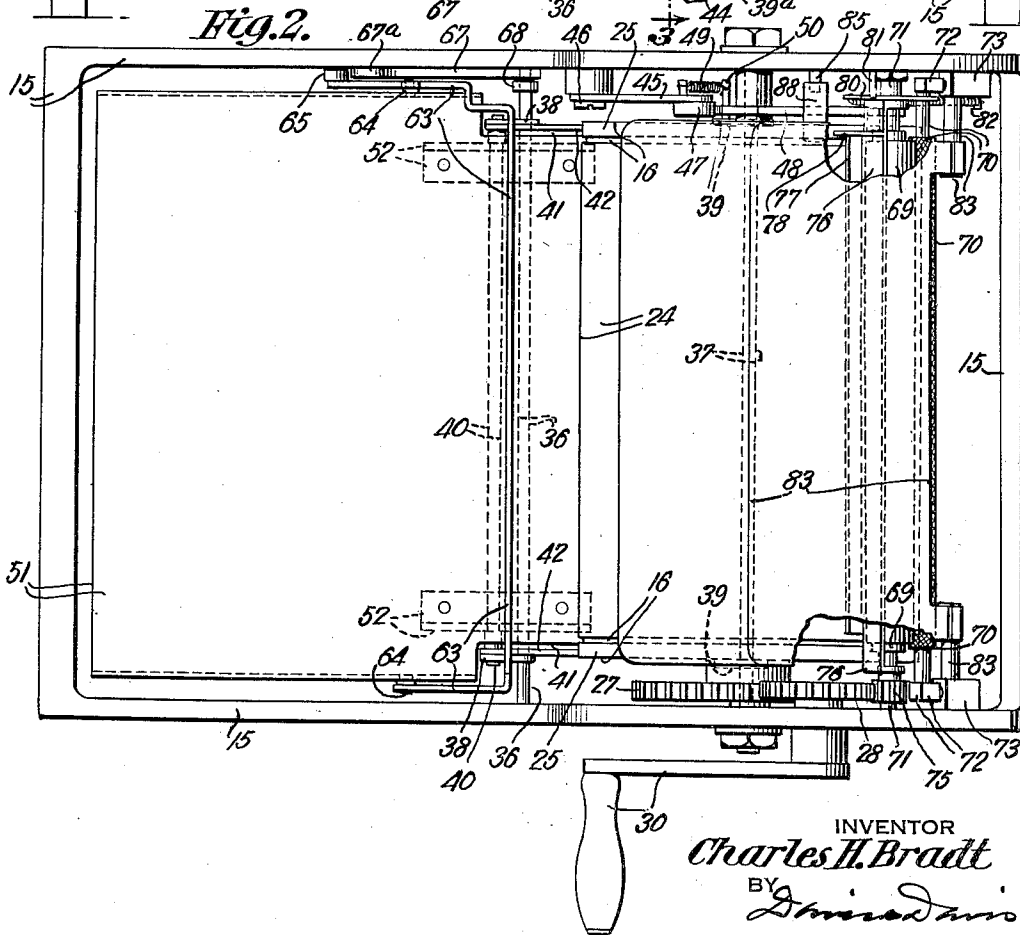


Fig. 2.



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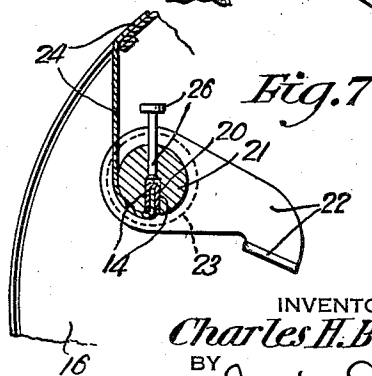
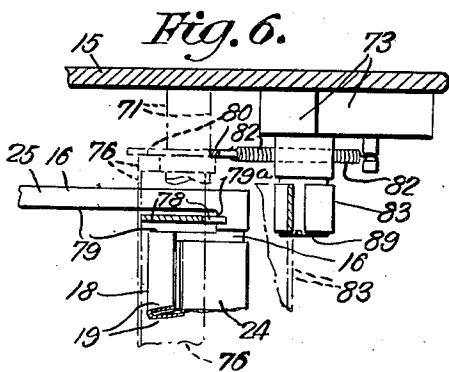
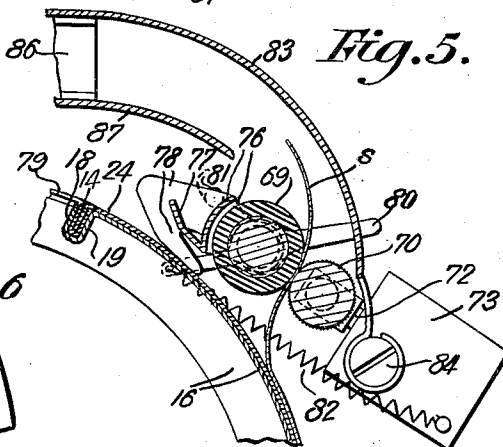
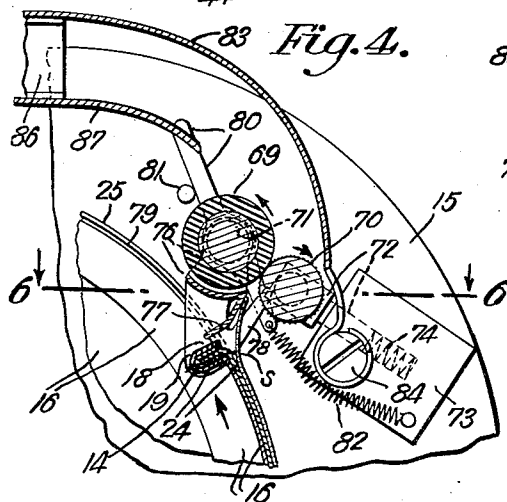
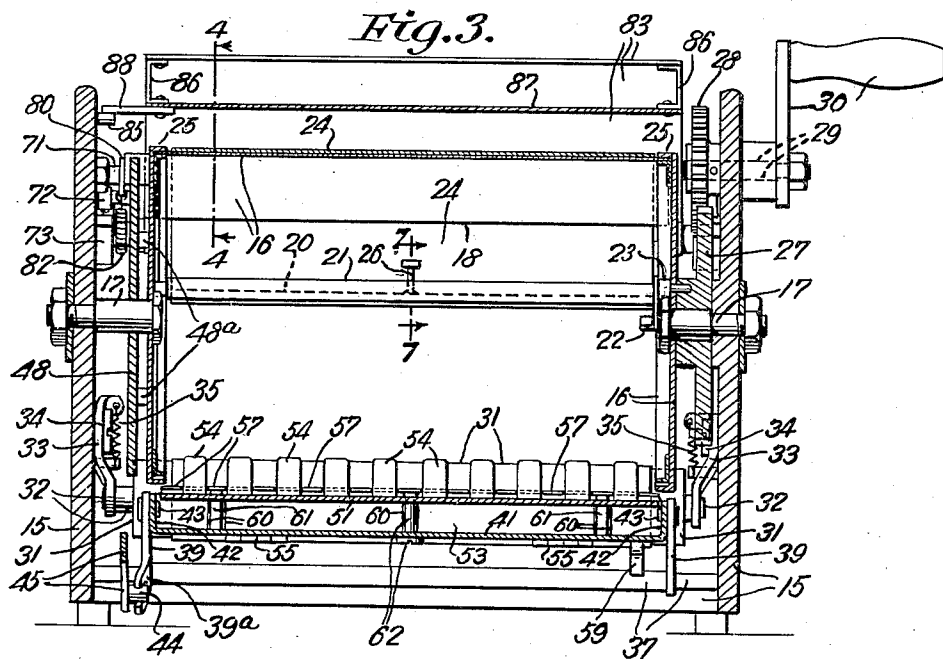
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ROTARY DUPLICATOR

Filed May 7, 1937

3 Sheets-Sheet 2



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2,154,604

ROTARY DUPLICATOR

Filed May 7, 1937

3 Sheets-Sheet 3

Fig. 8.

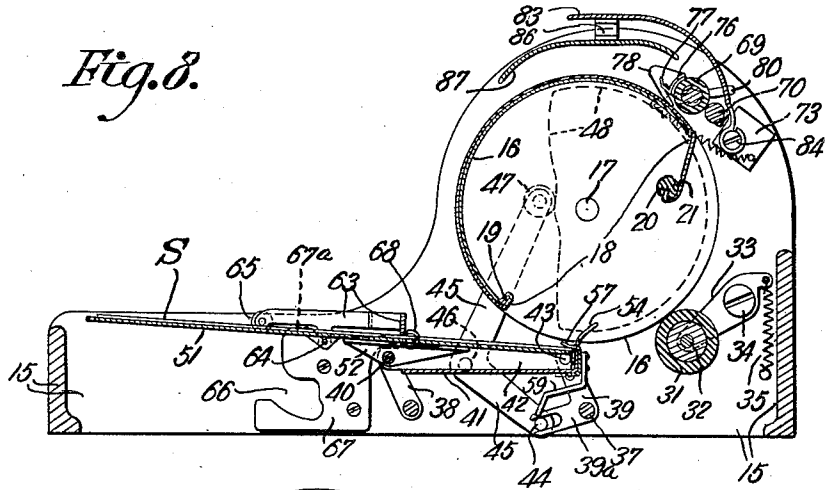


Fig. 9.

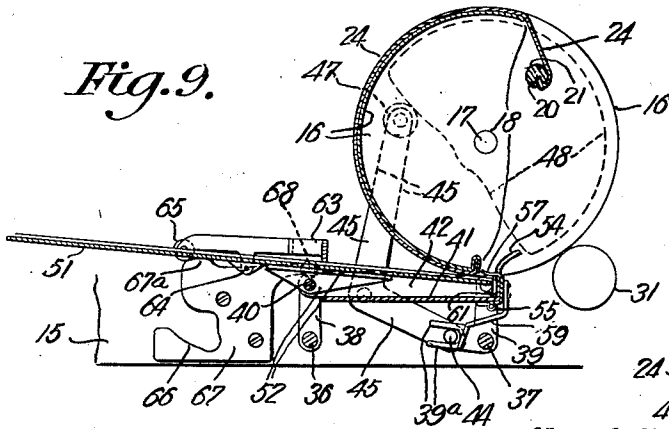


Fig. 10.

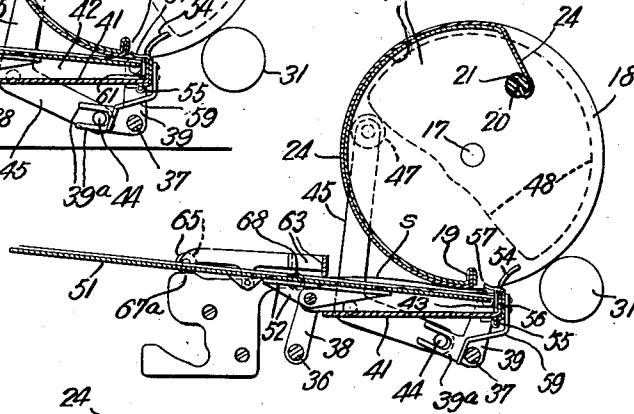
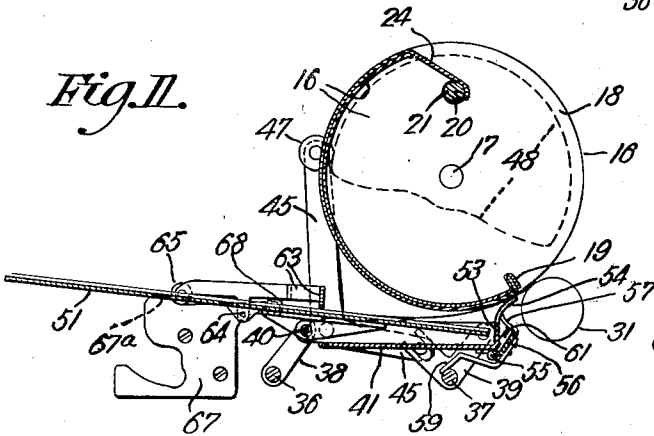


Fig. 11.



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UNITED STATES PATENT OFFICE

2,154,604

ROTARY DUPLICATOR

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Application May 7, 1937, Serial No. 141,264

17 Claims. (Cl. 101—132)

The invention relates to rotary duplicators and more particularly to rotary duplicators of the kind in which a negative or reversed impression of matter to be copied is impressed upon a gelatinous hectographic or similar adhesive duplicating surface carried by a rotary member and positive impressions or copies are taken by impressing sheets of paper on the negative-bearing surface.

One of the principal objects of the invention is to provide an improved duplicator of the kind set forth whereby rapid impression and stripping of successive sheets is facilitated and high speed production of copies may be satisfactorily attained. Another object of the invention is to provide a simple and improved mechanism whereby sheets may be fed one at a time from a pack, impressed on the adhesive surface, and stripped from said surface. Another object of the invention is to provide for delivery of the sheets free from curl. Another object of the invention is to provide a machine of the kind set forth which will with certainty take one sheet at a time from a pack, produce a positive copy on the sheet and deliver the sheet from the machine.

Other purposes and advantages of the invention will appear from the following description of the preferred embodiment of the invention shown in the drawings.

In the accompanying drawings showing the preferred embodiment of the invention,

Fig. 1 is a side view of the machine, part of the right hand side of the machine frame being broken away, and the parts being shown positioned for introduction of a pack of copy sheets into the machine;

Fig. 2 is a top plan view of the machine ready to start the making of copies;

Fig. 3 is a vertical transverse sectional view on the line 3—3 of Fig. 1;

Figs. 4 and 5 are detail sectional views taken on the line 4—4 of Fig. 3 and showing successive stages of the sheet stripping operation;

Fig. 6 is a detail sectional view on the line 6—6 of Fig. 4;

Fig. 7 is a detail sectional view on the line 7—7 of Fig. 3; and

Figs. 8, 9, 10 and 11 are detail sectional views showing successive stages of the sheet feeding operation.

The machine has a main frame 15 having front, rear and side walls. The duplicating cylinder 16 extends horizontally between the side walls of the frame adjacent the rear end of the frame and is rotatively journaled on stub axles 17 fixedly mounted on the side walls. The peripheral wall

of the cylinder is cut away substantially from end to end of the cylinder for approximately half the circumference of the cylinder to provide an arcuate back bed for a hectographic adhesive duplicating surface or medium with a gap 18 between the ends of said bed. While the adhesive duplicating medium of gelatin or other suitable material may be secured in any manner on the bed, it preferably consists of the usual copying band 24 with outer adhesive duplicating surface of gelatin, which band is stretched over the bed with one end of the band anchored in a channel 19 at one edge of the gap 18 and the other end of the band extending inside the drum and anchored in a slot or channel 20 in a band-tightening spindle 21. Spindle 21 is journaled in the end walls of the cylinder. A hand lever 22 fixed to the spindle may be employed to tighten and loosen the gelatin band, and a friction washer 23 at one end of the spindle and bearing on the adjacent end wall of the cylinder is provided for holding the spindle against accidental rotation. The band 24 is of less width than the length of the cylinder, leaving the end portions 25 of the cylinder exposed at the periphery of the cylinder. The anchored ends of the band are each bound with a metallic edge member or stiffening member 14. To facilitate dislodging of the band from the channel in spindle 21, said spindle has extending radially therethrough midway its ends in alignment with channel 20 a plunger 26 having a head inside the channel and a head outside the spindle. By pushing on the plunger the band may be ejected from channel 20.

Fixed to the right hand end of the cylinder 16 is a pinion 27 which meshes with a pinion 28 fixed on a handle shaft 29. Shaft 29 extends through, and is journaled in, the right hand side wall of the main frame and has fixed on its outer end a crank handle 30 for actuating the machine. As more fully hereinafter explained, rotation of handle 30 in clockwise direction actuates the machine to introduce sheets one at a time into the machine for impression one at a time upon the gelatin band and stripping of each impressed sheet from the band.

For impressing an introduced sheet on the adhesive gelatinous duplicating surface of the band there is provided a horizontally disposed sheet-impressing or platen roller 31 having a rubber surface and also having a shaft 32 journaled in arms 33 pivoted on the side walls of the frame at 34. Springs 35 connected to arms 33 and the frame yieldingly urge roller 31 to the band and the periphery of cylinder 16, said roller being long

enough, as shown more clearly in Fig. 3, to ride at its ends upon the exposed end portions 25 of the cylinder periphery when gap 18 is opposed to the roller. In the preferred construction shown, platen roller 31 extends under cylinder 16 slightly to the rear of the vertical plane in which the axis of the cylinder is located. Two horizontal rock shafts 36 and 37, which extend transversely of the machine below the level of the duplicating drum or cylinder 16 and are spaced apart fore-and-aft of the machine, are journaled in the frame at opposite sides of the machine, the rear-most shaft 37 lying in the vertical plane of the axis of the drum or cylinder 16. A pair of rock arms 38 extend upwardly from shaft 36 adjacent the opposite sides of the machine, and a pair of rock arms 39 extend upwardly from shaft 37 adjacent opposite sides of the machine. The rock arms 38 are connected at their upper ends by a horizontal rod 40. Extending fore-and-aft of the machine is a platform or plate 41 having upstanding fore-and-aft extending side flanges 42 pivoted at their forward ends on rod 40 just inside of the rock arms 38, and also pivoted at their rear ends at 43 to the upper ends of rock arms 39 at the inner sides of said rock arms, for parallel motion of the two pairs of rock arms for fore-and-aft vibration or reciprocation of platform or plate 41.

For shifting the platform 41 fore-and-aft in synchronism or timed relation with the cylinder 16 during rotation of the latter, the left hand one of the rock arms 39 is provided with a forwardly extending slotted arm 39^a in the slot in which is engaged a stud 44 on the rearwardly extending arm of a bellcrank lever 45. Lever 45 is pivoted on the machine frame at 46 to rock in a fore-and-aft extending plane and has an upstanding rock arm which is provided at its upper end with a roller 47 riding on the periphery of a cam disk 48. Cam 48 is held by suitable fastenings 48^a to the left hand end of cylinder 16 to rotate in unison with said cylinder about the cylinder axis, and roller 47 is held to the periphery of the cam by a pull spring 49 connected at its opposite ends with the upstanding arm of lever 45 and with a projection 50 carried by the left hand one of the rock arms 39. Cam 48 has a long high dwell edge portion and a short low dwell edge portion, both concentric with the cam axis and connected by two active cam edge portions.

A sheet supporting or sheet-pack supporting table 51 extends forwardly from between cylinder 16 and platform 41 substantially to the forward end of the machine frame. This table is pivoted on rod 40, by means of suitable pivot brackets 52 held fixedly to the under face of the table, for teetering of the table about the rod 40. The table is overbalanced forward of rod 40, as by having a greater length and width forward of said rod than rearward of said rod, so that the rear portion of the table is urged upward constantly by the weight of the forward portion of the table. The narrower rear portion of the table is movable up and down above platform 41 between the side flanges 42 of the platform. The table 51 is thus shiftable fore-and-aft with the platform and tiltable about rod 40 relatively to the platform 41.

Platform 41 has along its rear edge an upstanding flange 53 located slightly to the rear of the rear edge of table 51, from the upper edge of which flange extend upwardly and rearwardly the several fingers of a row of paper-sheet-guiding fingers 54. Hinged at 55 to platform 41 at the rear edge of the platform, to swing against and

away from the rear face of flange 53, is a bar 56 provided along its upper edge with a row of forwardly extending fingers 57 adapted to project forwardly over flange 53 to overhang table 51 to limit upward movement of the rear end of table 51. Bar 56 is normally held abutted against flange 53 with fingers 57 overhanging the table by means of a spring 58 connected to said bar and to the right hand side flange 42 of platform 41. A pendent rigid arm 59 fixed to bar 56 is engageable with rock shaft 37 to rock said bar and its fingers 57 rearward into the position shown in Fig. 11 as more fully hereinafter explained.

Preferably, flange 53 is provided with a plurality of parallel vertical slots 60 and bar 56 is provided on its front face with a corresponding plurality of parallel vertical paper-sheet-aligning ribs 61 which protrude through said slots at the rear edge of table 51 when bar 56 is abutted against flange 53.

As a precaution against possible elevation of the table at its rear, by mal-operation of the machine, to a level too high for the fingers 57 to engage over the table, a stud 62 is provided which depends from the table through an aperture in platform 41 and has at its lower end a head for abutting the platform to limit lifting of the rear end of the table to the maximum level of such lift permitted by the fingers 57 when the latter overhang the table.

A sheet or sheet-pack clamping bail 63 has its side arms pivotally held to the table 51 at 64 forward of the pivotal axis of the table for swinging of the bail up and down from an upstanding sheet-pack insertion position shown in Fig. 1 to a working position in which the cross-bar of the bail engages over the sheet pack to the rear of the pivotal axis of the table. For setting and holding the bail and table in position for inserting a pack of paper sheets in the machine, the left hand side arm of the bail is extended forward of its pivot 64 and provided at its forward end with a roller 65 which, when the bail is rocked forward and upward enters a cam slot 66 in a cam plate 67, said roller riding rearward on the lower cam edge of the slot to the inner closed end of the slot to cam the front end of the table upward and hold the table propped in this position with the rear end of the table depressed away from fingers 57 substantially to platform 41. This leaves the operator's hands free to slide a pack of sheets S rearwardly on to the table beneath the bail and fingers 57 against the aligning ribs 61 on bar 56, thus aligning or squaring the pack with the cylinder 16. After insertion of the pack the bail is swung rearward down upon the pack, the bail resting by its weight on the pack and the table tilting automatically until arrested by contact of the top sheet of the pack with fingers 57. Cam slot 66 is open at its front end for entrance and exit of roller 65, and cam plate 67 is fixed to the main frame. A roller 68 is journaled on cam plate 67 for engagement of the left hand side arm of the bail with said roller to the rear of the pivotal axis of the bail at a predetermined time in the cycle of operation of the machine, as hereinafter explained. The upper edge of plate 67 is raised at the front end of the plate to provide a short hump 67^a.

The means heretofore described constitute the sheet feeding and impressing means of the duplicator by which sheets are taken one at a time from a pack of sheets and impressed. The means provided for stripping an impressed sheet from

the duplicating surface and discharging it from the machine will now be described. Extending horizontally across the machine in the rear upper portion of the machine frame, at a point above the platen roller 31 and close to but spaced from duplicating cylinder 16, is a pair of sheet-stripping rollers 69 and 70. The roller 69 is a rubber-faced roller having its shaft 71 journaled in the frame for rotation of the roller about a fixed axis. Roller 70 is a metal roller having a knurled periphery and reduced ends. The reduced ends of roller 70 are journaled in plungers 72 guided in blocks 73 fixed on the main frame, said plungers being acted on by springs 74 to press roller 70 yieldingly against roller 69. Rollers 69 and 70 are driven from pinion 28 which meshes with a pinion 75 fixed on the shaft of roller 69.

A sheet impressed and adhering to the band is carried along with its leading end slightly overhanging gap 18 in the cylinder 16 at the leading end of the duplicating surface, as more fully hereinafter explained. An automatically acting deflector is provided for deflecting the free leading end of the impressed sheet outward from cylinder 16 and guiding said sheet end into the bight of the pair of stripping rollers 69—70. This deflector comprises a yoke 76 pivoted at its ends on the shaft 71 of roller 69 and having extending therefrom outwardly away from the roller a sheet deflecting web or blade 77 movable by oscillation of the yoke, into and out of a position in which it projects into the gap 18 in cylinder 16. Adjacent its left hand end, yoke 76 is formed with a cam arm 78 extending outward from the yoke in the same direction as blade 77 and adapted to ride upon the left hand one of the end portions 25 of the periphery of cylinder 16 to hold blade 77 rocked in an inactive position out of contact with the duplicating surface during traverse of said surface past said blade, as shown in Figs. 2, 5 and 8. Said left hand end portion 25 of the cylinder periphery is notched or cut away along the left hand side of gap 18 as indicated at 79 to permit arm 78 and blade 77 to swing down into gap 18 with said blade in advance of the leading end of the duplicating medium and copy sheet and thereby position the blade, as shown in Fig. 4, for deflecting the leading end of the impressed sheet into the bight of rollers 69—70.

Fixed to yoke 76 at the left hand end of the yoke is a two-arm hand lever 80 the handle of which is engageable with a stop stud 81 on the frame to determine the working position of the deflector and the other arm of which is engageable with said stud to limit swinging of the deflector out of working position. The deflector is normally yieldingly urged toward working position by a spring 82 connected to said other arm of said hand lever and to the adjacent block 73 on the machine frame. By swinging lever 80 until said other arm engages said stud, and holding the lever in this position, the machine may be actuated to rotate the drum one or more times without deflection and stripping of an impressed sheet. Such manipulation of the machine is sometimes desirable, as when impressing a master sheet on the medium. Preferably the cut-out or notch 79 is extended beyond the gap 18 at the leading edge of the duplicating surface supporting periphery of the drum, as shown in Fig. 6, far enough for an initial return movement of the deflector to idle position by thrust of the front wall of channel 19 against the deflector blade, and for a final return movement of the deflector

by contact of arm 78 with the trailing end edge 79^a of notch 79 before the deflector blade 77 can engage the duplicating surface.

Copy sheets stripped from an adhesive duplicating medium such as a gelatinous hectographic duplicating medium have a marked and highly undesirable tendency to curl or roll up. Such curling or rolling up of stripped copy sheets is eliminated by the present improvements. It will be noted that the sheet being stripped in the present machine is bent rearward from the cylinder 16 by the stripping rollers. To give this sheet an additional reverse bend toward the front of the machine for insuring elimination of the tendency to curl, and for discharging the sheet forward of and above the cylinder for grasping of the leading end of the sheet by the operator with the left hand for stacking the copies while turning the handle 30 with the right hand to actuate the machine, the following means are provided.

An arcuate sheet deflector apron 83 is supported over the cylinder 16 by horizontal transversely extending pivots 84 located adjacent its rear edge and by a stop 85 on the machine frame forward of its pivot. Pivots 84 are carried by blocks 73 and the deflector apron 83 extends upward and forward over the cylinder 16 from behind roller 70. Suspended from the deflector 83 by brackets 86 is an arcuate paper table or apron 87 which lies between the cylinder 16 and deflector 83 and is spaced from both the cylinder and deflector. The table 87 extends forward over the cylinder 16 from a point above roller 69 and carries a projection 88 which normally rests upon frame stop 85. The deflector and connected table may be rocked upward and rearward about pivots 84 to expose the cylinder for free access thereto when desired, as for replacing the gelatin ban 24. From Fig. 5, it will be obvious that a sheet discharged from rollers 69—70 will be deflected forward by deflector 83 and delivered above the upper front portion of the cylinder 16, table 87 preventing the sheet from sagging or dropping down into contact with the duplicating cylinder or the gelatin medium thereon.

The operation of the duplicator is as follows:

With handle 30 standing in a clockwise rotated position bringing the low point of cam 48 in contact with roller 47 on lever 45 the sheet-pack supporting table stands at the forward limit of its motion shown in Figs. 1, 2, 3 and 8, and the leading edge of the duplicating surface is above and forward of the rear end of the table. For taking copies from a negative imprint in hectographic or other suitable copying ink previously produced on the duplicating surface, the operator swings bail 63 upward and forward from the position shown in Fig. 2 into the position shown in Fig. 1 thereby tilting the table about rod 40 into the position shown in Fig. 1 and locking it there through the medium of the bail and cam slot 66 in cam plate 67. The operator then slides a pack of copy sheets rearward on the table beneath the bail and under fingers 57, squares the pack with the duplicating cylinder with the rear edge of the pack abutting ribs or blocks 61, and then lowers the bail, whereupon the parts assume the position shown in Fig. 8, the rear end of the table rising under the influence of the predominating weight forward of pivot rod 40 until the top sheet of the pack abuts the under faces of fingers 57. The locations of the bail pivots 64 and table pivot rod 40 are such that, with the machine parts positioned as in Figs. 2 and 8, roller 65 on the bail is at the same level

irrespective of the number of sheets on the table, or of the presence or absence of sheets on the table. The level of the rear end of the table when empty, or of the top of the sheet pack at the rear end of the table, in this position of the parts is always the level determined by fingers 57. The cross-bar of the bail rests by gravity upon the top of the pack at a point in rear of the vertical plane of table pivot rod 40 in this position of the parts and the machine is ready for continuous operation to produce copies, the operator starting and continuing clockwise rotation of the handle 30 with the right hand until the sheet pack is exhausted or until a desired number of copies less than the number of sheets in the pack has been made. A description of a single cycle of operation involving a single revolution of the drum and the production of one copy will be sufficient.

As the drum starts to rotate in clockwise direction the low dwell portion of cam 48 leaves the roller 47 and the leading one of the two active edge portions of the cam acts on roller 47 to carry the table support rearward with increasing speed through the positions of Figs. 9 and 10 into the rearward limit of Fig. 11, whereupon the high dwell portion of the cam begins to pass roller 47 and the table support remains stationary until the trailing active edge portion of the cam acts on the roller for restoring the table support to its starting position. The level of the cylinder 15 is such that the rock arms cannot pass from forwardly inclined position of Fig. 8 to vertical position of Fig. 9 without slight depression of the rear end of the table by contact between the leading edge portion of the duplicating medium and the table if empty, or the top sheet of a pack on the table. Therefore, in passing from the position of Fig. 8 into the position of Fig. 9 the table and pack will be slightly tilted, the table tilting down at its rear end about rod 49 under thrust of the pack against the leading edge portion of gelatin band 24, thus pasting or sticking the upper sheet of the pack adjacent its rear or leading end to the leading edge portion of the gelatin band. The parts are so positioned and timed in operation that the pasted sheet protrudes slightly across the gap 18 in the cylinder to the rear of the leading edge of the gelatin band.

In Fig. 9 the roller 65 on bail 63 has moved rearward far enough to just come in contact with the forward end of hump 67^a on cam plate 67. In passing from Fig. 9 position to the positions of Figs. 10 and 11 the table axis 40 drops and the bail also coacts with cam plate 67 and roller 68 thereon, both in such manner that the remaining sheets of the pack are lowered from the rear portion of the pasted sheet to assist in freeing that sheet for withdrawal from the pack without dragging off any underlying sheet. The construction of the parts is such that the speed of the accelerated rearward motion of the table equals the speed of travel of the duplicating surface at the time the parts are in Fig. 9 or sheet pasting position, to thereby avoid injuring the gelatin and thereafter exceeds the speed of travel of the duplicating surface.

In passing from the position of Fig. 9 to that of Fig. 11 the roller 65 travels over the hump 67^a thereby forcing the bail cross-bar down on the pack with a slight depression of the rear part of the table to cause the pack to be tightly gripped between the bail cross-bar and the table, with the result that the difference in speed of travel of the table and duplicating surface buckles the

sheet *s* which is pasted to the drum, as indicated in Fig. 10. This assists further in freeing sheet *s* from the remainder of the pack for withdrawal of said sheet. Just before the table and its support reach the rearward limit of motion (the position shown in Fig. 11) roller 65 begins to ride down off the hump 67^a and, at the same time, the left hand side arm of the bail begins to ride, at a point in rear of the bail axis, on roller 68 and this causes a further tilting downward of the rear end of the table which releases the pack from clamping action of the table and bail and frees sheet *s* for withdrawal. To further insure freedom of sheet *s* for withdrawal, arm 59 is rocked, in passing from Fig. 10 to Fig. 11 position, by thrust of said arm against rock shaft 37 to rock bar 56 and its fingers 57 rearward far enough to carry the fingers 57 from over the table to a point to the rear of the guide fingers 54.

The sheet *s* adhering to the drum is advanced by the drum past the platen roller 31 which impresses the sheet on the duplicating surface to transfer a positive copy to the sheet. Fingers 54 guide the free leading edge of the sheet to the top of the roller to prevent accidental bending back and creasing of said end of the sheet. As the sheet *s* is carried on to the position shown in Fig. 4 its free leading end is deflected by the blade 77 into the bight of the stripping rollers 69-70 and deflected forward between deflector 33 and paper table 87. Rollers 69 and 70 discharge the stripped sheet which is grasped at its leading end in the left hand of the operator and stacked.

The high dwell portion of cam 48 contacts roller 47 until the trailing end of the duplicating surface passes fingers 54, whereupon the trailing active edge of cam 48 coacts with roller 47 for quick return of the pack supporting table and its support to the starting position of Fig. 8 while the gap 18 of the cylinder is facing the table. There is thus no possibility of the sheet pack or of fingers 54 and 57 contacting the duplicating surface during return movement of the table.

The negative impression may be produced on the band by laying and impressing on the duplicating surface in any suitable manner a master sheet having thereon in suitable copying ink the matter to be copied and then stripping the master sheet in any suitable manner from the duplicating surface. However, the master sheet may be placed inscribed or inked face up directly on the stack-supporting table in the same manner as the pack of copy sheets *S* and laid and impressed by actuating the machine as above described. Since it is desirable that the master sheet remain in contact with the gelatin surface long enough for transfer a large quantity of ink to the gelatin band, in laying and impressing the master sheet, this can be accomplished by holding the deflector 77 out of operative position for two or more revolutions of the cylinder 15 by means of hand lever 86 as hereinbefore described.

What I claim is:

1. In a rotary duplicator, a rotary duplicating cylinder having an adhesive duplicating surface and supported for rotation about a fixed axis, means for rotating said cylinder, means for shifting a pack of sheets momentarily into face contact adjacent the leading end of the pack with said surface of said cylinder while advancing the pack edgewise in the direction of rotation of the cylinder at a speed equal to the speed of the duplicating surface during the contact interval and greater thereafter and for subsequently reversing the advance movement of the pack, means

for clamping and releasing the pack between the times of contact of the pack with the duplicating surface and reversal of advance movement of the pack to thereby first buckle and then release the sheet of the pack pasted to the duplicating surface by the face contacting of the pack with said surface, and means for impressing to the duplicating surface the trailing portion of the sheet pasted thereto.

10 2. In a rotary duplicator, a rotary duplicating cylinder having an adhesive duplicating surface and supported for rotation about a fixed axis, means for rotating said cylinder, means for shifting a pack of sheets momentarily into face contact adjacent the leading end of the pack with said surface of said cylinder while advancing the pack edgewise in the direction of rotation of the cylinder at a speed equal to the speed of the duplicating surface during the contact interval and greater thereafter and for subsequently reversing the advance movement of the pack, means for clamping and releasing the pack between the times of contact of the pack with the duplicating surface and reversal of advance movement of the pack to thereby first buckle and then release the sheet of the pack pasted to the duplicating surface by the face contacting of the pack with said surface, means for impressing to the duplicating surface the trailing portion of the sheet pasted thereto, and means for pulling the impressed sheet in one direction from said surface and reversely bending said sheet and discharging it.

3. A rotary duplicator having a rotary duplicating drum which is supported for rotation about a fixed axis and provided with an adhesive duplicating surface extending part way only around the drum periphery to leave a gap between the leading and trailing ends of said surface, means for rotating the drum, sheet pack carrying means for pressing a pack of sheets adjacent one end facewise to the leading end portion of the adhesive surface of the drum during each revolution of the drum with a free end portion of the surface contacting sheet of the pack overhanging said gap for advance of the sheet by the drum, means for pressing the trailing portion of the surface contacting sheet to the pack and relieving the pressure while advancing the pack in the direction of, and at greater speed than, the advance of said sheet by the drum, means for impressing the advancing sheet to the copying surface of the drum, and means coactive with the free gap-overhanging end of the sheet for picking up and stripping the sheet from the drum.

4. A rotary duplicator as claimed in claim 3, wherein the sheet pack carrying means comprises a parallel link motion support opposed to the drum and operable in synchronism therewith to shift first in the direction of rotation of the drum with a movement toward and from the drum and then return to its starting point during each revolution of the drum, a sheet pack supporting table extending longitudinally from the drum and tiltably mounted intermediate its ends on said support for depression by the drum of the end of said table which is nearest the drum upon rising motion of said support during movement of the support in the direction of rotation of the drum, said table being constantly urged to tilt said last-mentioned end toward the drum, and means on the support for limiting motion of said end of the table or a sheet pack on the table toward the drum, and wherein said

means for pressing the drum engaging sheet to the pack comprises a bail pivotally held to the table, and means engageable with said bail to cause the latter to press the pack to the table and to relieve the pressure of the bail on the pack.

5. A rotary duplicator having a rotary drum with an adhesive duplicating surface at its periphery, means supporting said drum for rotation about a fixed horizontal axis, means for rotating the drum, a parallel link motion support below the drum and actuated in synchronism with the drum during each revolution of the drum to first advance in the direction of rotation of the drum with a rising and then a falling motion and then reversely move to its starting point, a sheet supporting table pivotally mounted on said support to tilt about a horizontal axis parallel with the drum axis, said table having its rear end under the drum and overbalanced by its front end, said rear end of the table being depressible by thrust thereof against the duplicating surface of the drum at the limit of rising movement of said support, the duplicating surface of the drum having a gap therein opposed to the rear end of the table during return movement of said support, releasable means on said support for engaging over the rear end of the sheet supporting table or a sheet or sheets thereon to limit upward movement of the table, automatic means for releasing said means to prevent contact of the duplicating surface therewith, a sheet clamping bail pivoted to the table forward of the pivotal axis of the table to bear down on the table with the cross-bar of said bail in rear of the pivotal axis of the table, means engageable by said bail during rearward movement of the table to press the bail cross-bar toward the table and relieve said pressure, and means for impressing to the duplicating surface of the drum a sheet stuck to that surface by thrust of the table toward the drum and thereafter withdrawn from the table by rotation of the drum.

6. A rotary duplicator, as claimed in claim 5, having fixed cam means on the main frame engageable with the bail to tilt the table to depress the rear end of the table away from said releasable means and hold it depressed when the bail is manually swung upward about its pivotal axis into a substantially vertical position, to facilitate placing of a pack of sheets on the table.

7. In a rotary duplicator, a rotary duplicating cylinder having an adhesive duplicating surface and supported for rotation about a fixed axis, means for rotating said cylinder, means for shifting a pack of sheets momentarily into face contact adjacent the leading end of the pack with said surface of said cylinder, means for advancing the pack edgewise in the direction of rotation of the cylinder to thereby buckle the sheet of the pack pasted to the duplicating surface, and means for impressing to the duplicating surface the trailing portion of the sheet pasted thereto.

8. In a rotary duplicator, a rotary duplicating cylinder having an adhesive duplicating surface and supported for rotation about a fixed axis, means for rotating said cylinder, means for shifting a pack of sheets momentarily into face contact adjacent the leading end of the pack with said surface of said cylinder to attach the topmost sheet to the cylinder, means for advancing the said attached sheet edgewise in the direction of rotation of the cylinder at a speed greater than

the speed of the duplicating surface to thereby buckle the sheet of the pack pasted to the duplicating surface by the face contacting of the pack with said surface, and means for impressing to the duplicating surface the trailing portion of the sheet pasted thereto.

9. A rotary duplicator comprising a rotary duplicating cylinder supported for rotation about a fixed axis and having an adhesive peripheral duplicating surface which extends only part way about the cylinder, a pair of contactive sheet-stripping rollers parallel to and spaced from the cylinder, means for rotating the cylinder, means for pasting a sheet adjacent one end to the duplicating surface at the leading end of said surface with a free leading end portion of said sheet in advance of the leading edge of said surface, a sheet-deflector blade extending longitudinally of the cylinder and oscillative about a fixed axis parallel with and outside of the cylinder to swing toward and from the bight of said pair of stripping rollers respectively into and out of the path of the free leading end of the sheet, means for swinging said blade toward the bight of said pair of stripping rollers and interposing the blade between the ends of the duplicating surface in the path of said free leading end of the sheet during each rotation of the cylinder in position for engagement of the blade by said sheet end to deflect said sheet end into the bight of said rollers, and means for automatically swinging said blade away from the bight of said pair of stripping rollers to a position outside of the cylinder and preventing said blade from contacting the duplicating surface during rotation of the cylinder.

10. A rotary duplicator comprising a rotary duplicating cylinder supported for rotation about a fixed axis and having an adhesive peripheral duplicating surface which extends only part way about the cylinder, a pair of contactive sheet-stripping rollers parallel to and spaced from the cylinder, means for rotating the cylinder, means for pasting a sheet adjacent one end of the duplicating surface at the leading end of said surface with a free leading end portion of said sheet in advance of the leading edge of said surface, a sheet-deflector blade extending longitudinally of the cylinder and oscillative about a fixed axis parallel with the cylinder axis, an arm carried by said blade and adapted to ride on the cylinder to hold the blade retracted from the cylinder and the bight of said pair of stripping rollers out of the path of the free leading end of the sheet, a portion of the cylinder being cut-away to permit said arm and blade to swing partly into the cylinder to swing said blade toward the bight of said pair of stripping rollers into the path of the free leading end of the sheet, means for swinging said blade toward the bight of said pair of stripping rollers and interposing said blade in between the ends of the duplicating surface in the path of said free leading end of the sheet during each rotation of the drum to deflect said sheet end into the bight of said rollers, and means for contacting said arm to automatically swing the arm and blade outwardly to retract the blade from the bight of said pair of stripping rollers and prevent said blade from contacting the duplicating surface during rotation of the cylinder.

11. A rotary duplicator comprising a rotary duplicating cylinder supported for rotation about a fixed axis and having an adhesive peripheral duplicating surface which extends only part way about the cylinder, a pair of contactive sheet-

stripping rollers parallel to and spaced from the cylinder, mean for rotating the cylinder, means for pasting a sheet adjacent one end to the duplicating surface at the leading end of said surface with a free leading end portion of said sheet in advance of the leading edge of said surface, a sheet-deflector blade extending longitudinally of the cylinder and oscillative about the axis of one of said stripping rollers to swing toward and from the bight of said pair of stripping rollers respectively into and out of the path of the free leading end of the sheet, means for swinging said blade toward the bight of said pair of stripping rollers and interposing the blade in between the ends of the duplicating surface in the path of said free leading end of the sheet during each rotation of the cylinder for engagement of the leading end of said sheet with said blade to deflect said sheet end into the bight of said rollers, and means for automatically swinging said blade away from the bight of said pair of stripping rollers to a position outside of the cylinder and preventing said blade from contacting the duplicating surface during rotation of the cylinder.

12. In a rotary duplicator, a copying band backing drum having a band-backing periphery slotted longitudinally of the drum and provided along one longitudinal edge of said slot with a copying band anchoring channel, a copying band anchoring and stretching spindle extending longitudinally of the drum within the drum and journaled in the drum and having extending longitudinally thereof a copying band anchoring channel, a copying band backed by the drum and having metal bound end edges engaged in said anchoring channels, means within the drum for rotatively adjusting the spindle to stretch and loosen the backed copying band on the drum, friction means within the drum for holding the spindle in band-stretching rotatively adjusted position, and a manually operable plunger device carried by the spindle within the drum and operable to exert thrust on the metal bound end edge of the band anchored in the spindle channel to thrust said end edge of the band out of said channel.

13. A rotary duplicator having a duplicating drum having an adhesive copying surface extending part way about the drum with a gap extending longitudinally of the drum between the ends of said surface, means for rotating said drum, a platen roller yieldingly urged to said drum, means for pasting a sheet adjacent one end of the sheet to the leading end portion of the copying surface of the drum with said sheet slightly overhanging said gap for advance of the sheet by the drum to said platen roller for progressive impression of the sheet on the copying surface by the platen roller, a pair of contactive stripping rollers driven from the drum rotating means and supported outside of and independently of the drum in the rear of the upper portion thereof and parallel thereto out of contact with the duplicating surface of the drum and located for advance of the copy sheet past the platen roller to said stripping rollers, pivoted means outside of the drum for deflecting the gap-overhanging end of the sheet outwardly into the bight of said pair of rollers for bending and pulling of said sheet rearwardly from and off of the duplicating surface of the drum adjacent the upper rear portion of the drum, a sheet deflector apron for bending said sheet, as it issues from said rollers, upwardly and forwardly over the drum, and a sheet-supporting apron interposed between said deflector apron and the periphery of the drum.

14. A rotary duplicator as claimed in claim 13, in which the deflector apron and sheet-supporting apron are fixedly connected together and are hingedly supported to swing away from the drum to facilitate access to the drum.

15. A rotary duplicator as claimed in claim 13, in which a sheet to be impressed on and stripped from the copying surface is supported on a feed table located at the lower forward portion of the drum and the sheet is moved rearwardly and pasted adjacent its rear end to the copying surface at the bottom of the drum, the platen roller is located at the rear lower portion of the drum, the deflecting means and stripping rollers are arranged at the rear of the upper portion of the drum for rearward stripping of the sheet adjacent the top of the drum, and the sheet deflector apron and the sheet supporting apron are arranged at the upper part of the drum to discharge a stripped sheet therebetween forwardly over the drum.

16. A rotary duplicator having a rotary drum with an adhesive duplicating surface at its periphery, means supporting said drum for rotation about a fixed horizontal axis, means for rotating the drum, a support actuated in synchronism with the drum during each revolution of the drum to first advance in the direction of rotation of the drum and then reversely move to its starting point, a sheet supporting table pivotally mounted on said support to tilt about a horizontal axis parallel with the drum axis, said table having its rear end under the drum and overbalanced by its front end, said rear end of the table being depressible by thrust thereof against the duplicating surface of the drum at the limit of rising movement of said support, the duplicating surface of the drum having a gap therein opposed to the rear end of the table during return movement of said support, releasable means on said support for engaging over the rear end of the sheet supporting

table or a sheet or sheets thereon to limit upward movement of the table, automatic means for releasing said means to prevent contact of the duplicating surface therewith, and means for impressing to the duplicating surface of the drum a sheet stuck to that surface by thrust of the table toward the drum and thereafter withdrawn from the table by rotation of the drum.

17. A rotary duplicator having a rotary drum with an adhesive duplicating surface at its periphery, means supporting said drum for rotation about a fixed horizontal axis, means for rotating the drum, a parallel link motion support below the drum and actuated in synchronism with the drum during each revolution of the drum to first advance in the direction of rotation of the drum with a rising and then a falling motion and then reversely move to its starting point, a sheet supporting table pivotally mounted on said support to tilt about a horizontal axis parallel with the drum axis, said table having its rear end under the drum and overbalanced by its front end, said rear end of the table being depressible by thrust thereof against the duplicating surface of the drum at the limit of rising movement of said support, the duplicating surface of the drum having a gap therein opposed to the rear end of the table during return movement of said support, releasable means on said support for engaging over the rear end of the sheet supporting table or a sheet or sheets thereon to limit upward movement of the table, automatic means for releasing said means to prevent contact of the duplicating surface therewith, and means for impressing to the duplicating surface of the drum a sheet stuck to that surface by thrust of the table toward the drum and thereafter withdrawn from the table by rotation of the drum.

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