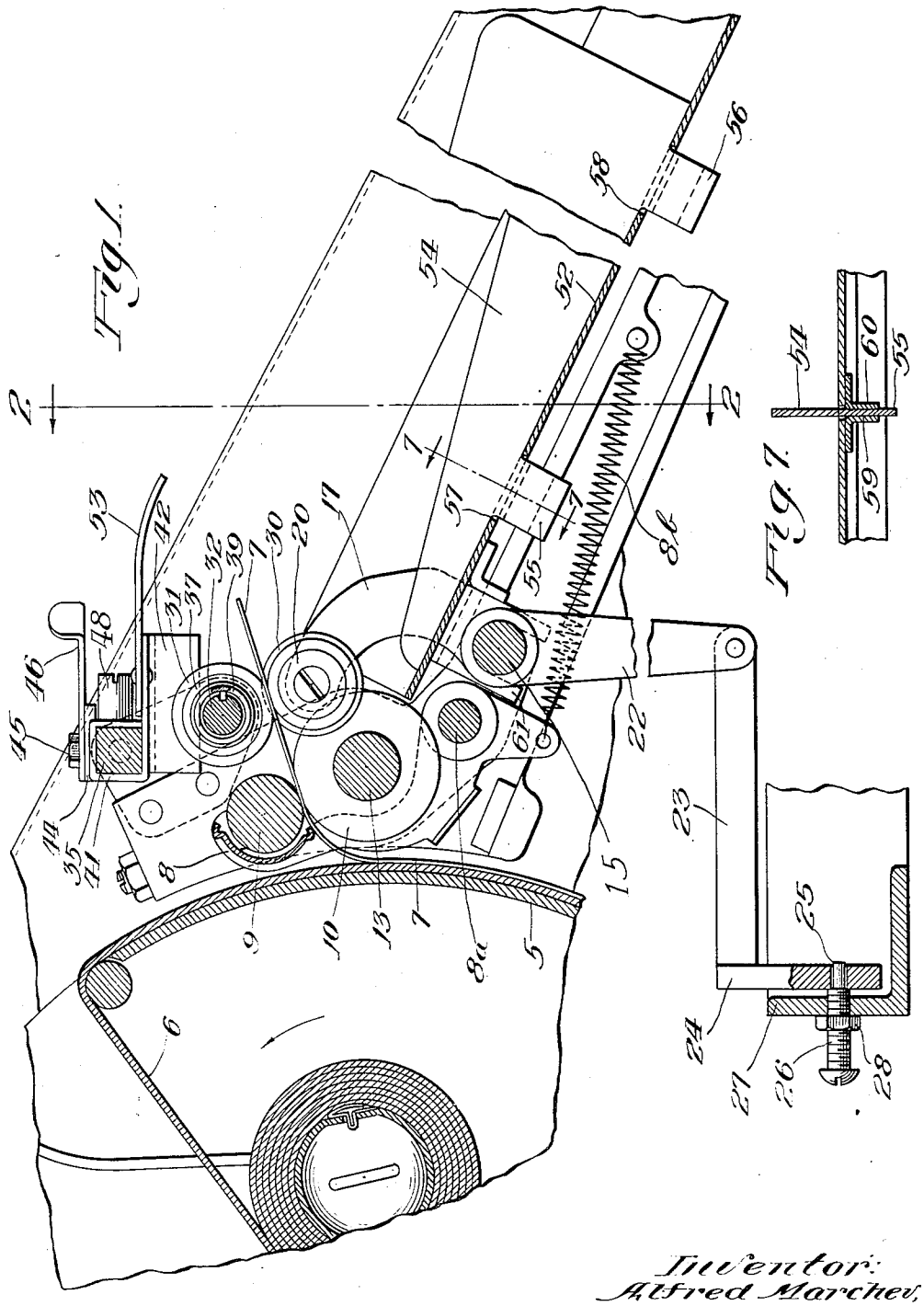
Jan. 12, 1937. A. MARCHEV 2,067,404

SHEET STRIPPING AND SLITTING MEANS FOR DUPLICATING MACHINES

Filed Oct. 14, 1935 3 Sheets-Sheet 1



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Filed Oct. 14, 1935 3 Sheets-Sheet 2

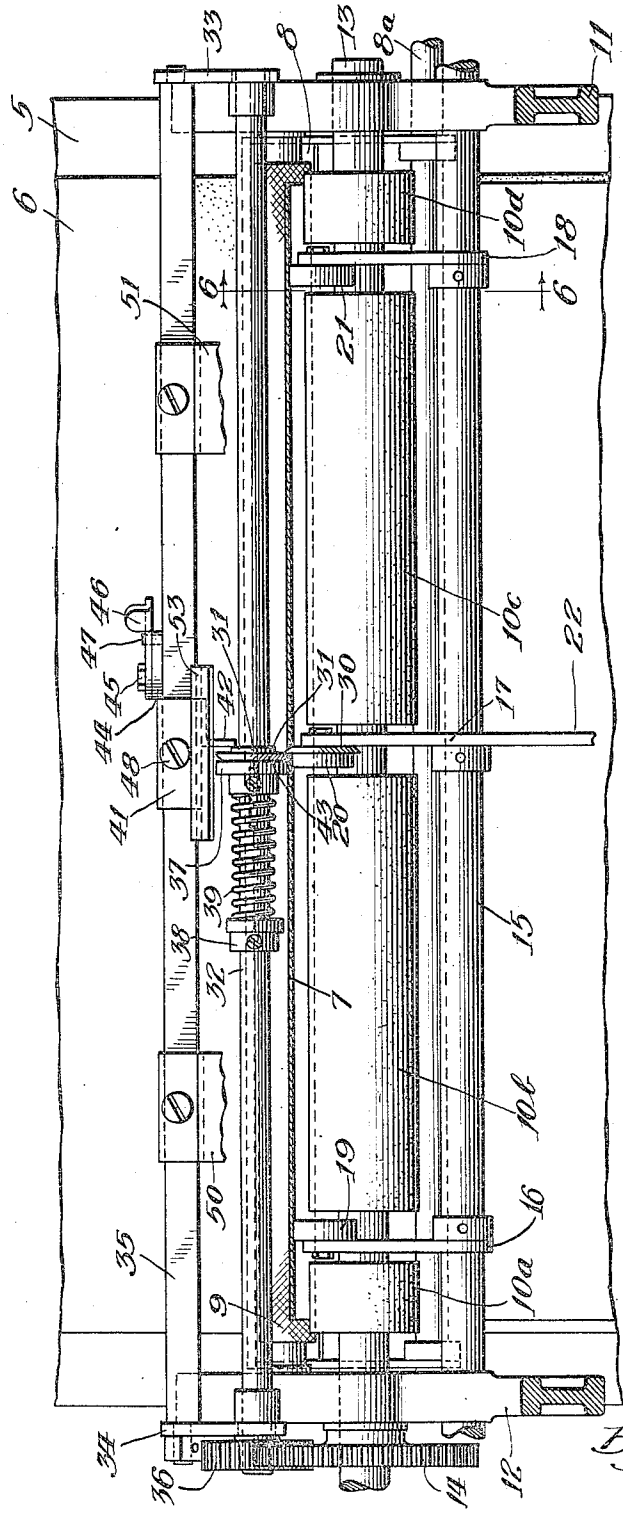


Fig. 2.

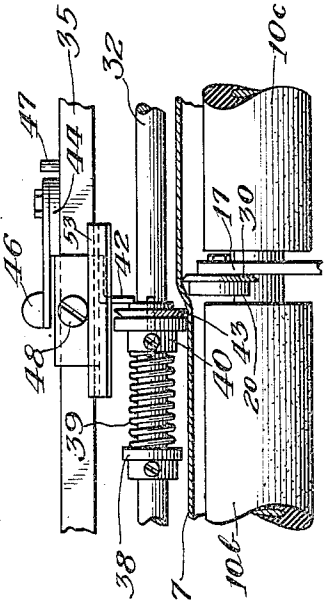


Fig. 3.

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Fig. 4.

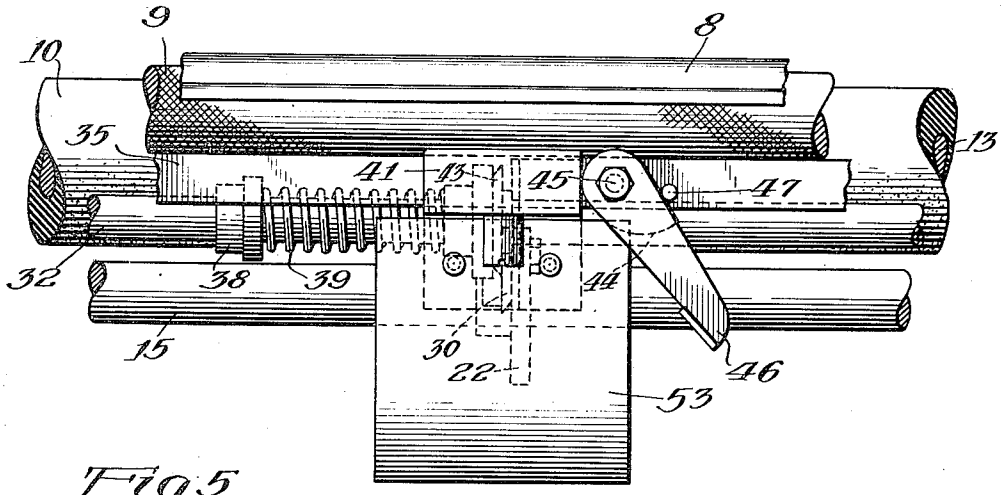


Fig. 5.

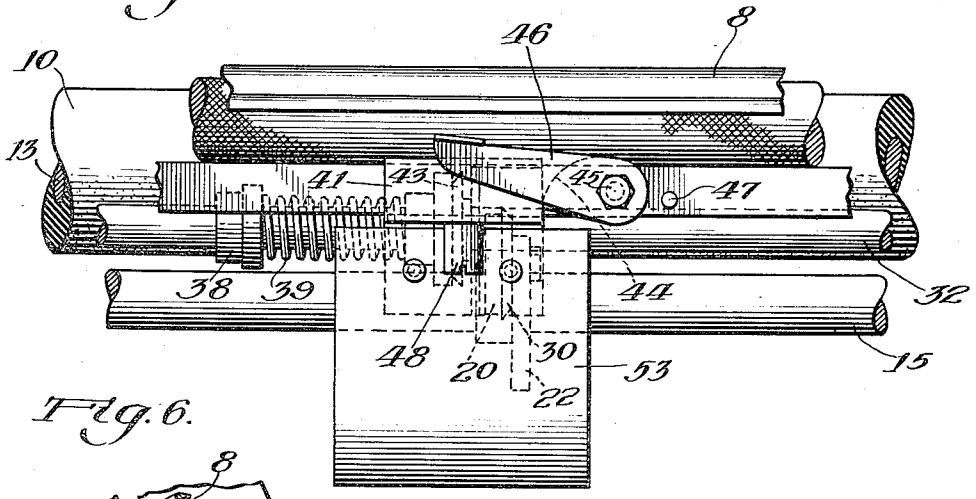
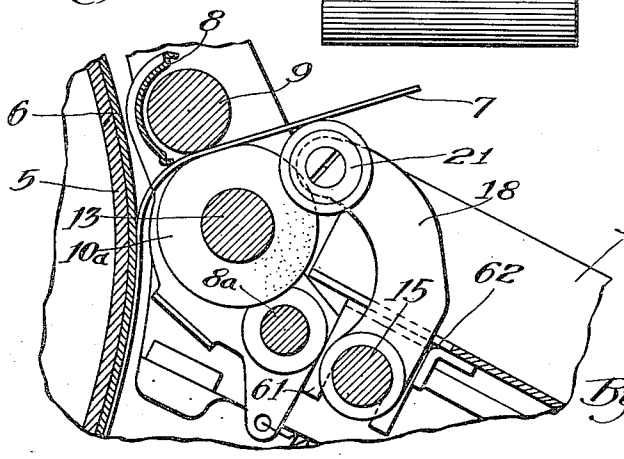


Fig. 6.



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UNITED STATES PATENT OFFICE

2,067,404

SHEET STRIPPING AND SLITTING MEANS FOR DUPLICATING MACHINES

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Application October 14, 1935, Serial No. 44,922

10 Claims. (Cl. 101—132)

This invention relates to duplicating machines of the hectograph type shown in the co-pending application Serial No. 713,590, filed March 1, 1934, by John W. Hernlund, Alfred Marchev, and Robert F. Morrison.

While the invention is disclosed in connection with a duplicator of the hectograph type, it is to be understood that certain features of the invention may be employed with advantage in duplicating machines of other types.

The present invention is particularly directed toward improvements relating to the stripping means whereby sheets are stripped from the duplicating surface.

The improved stripping means comprises essentially stripping rollers together with means associated with one of the rollers to prevent the sheets from winding on this roller. In machines of the type disclosed in the prior application hereinbefore mentioned, the stripping rollers usually comprise a lower rubber roller over which the sheets pass as they are stripped from the drum and an upper knurled metal roller. The sheets have a tendency to cling to the rubber roller and to be carried around the roller so that they will not be discharged into the receiving tray. The stripping means embodying the present invention avoids this difficulty.

The stripping mechanism embodying the present invention also includes sheet cutting means whereby a wide sheet being stripped from the drum may be cut as it is stripped into a plurality of narrower sheets.

Other features and advantages of the invention will become apparent from the following description reference being had to the accompanying drawings in which—

Fig. 1 is a fragmentary sectional view through the stripping mechanism and a portion of the drum of a duplicating machine of the type above referred to;

Fig. 2 is a view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary view showing the mechanism in the central portion of Fig. 2 in a changed position;

Figs. 4 and 5 are fragmentary plan views of the stripping mechanism and cutting mechanism showing two different positions of the cutting mechanism;

Fig. 6 is a sectional view on the line 6—6 of Fig. 2; and

Fig. 7 is a fragmentary sectional view on the line 7—7 of Fig. 1.

Referring now to the drawings and particularly to Fig. 1, a portion of a duplicating drum is shown at 5. This drum is provided with a duplicating band 6 which may be the usual gelatin band employed in machines of this character. In duplicating machines of the character disclosed in the aforementioned application, the duplicating drum 5 is rotated by suitable mechanism in the direction of the arrow on Fig. 1. In the making of copies, a master sheet is first applied to the gelatin band 6 which is stretched over the drum 5, and the material to be copied is thus transferred to the gelatin band in a manner which is well known in the art. The master sheet is then stripped from the drum, and copy sheets are applied to the surface of the gelatin band to receive the impression and make copies of the matter transferred to the gelatin band from the master sheet. The present invention is directed to the stripping mechanism whereby master sheets and copy sheets are stripped from the drum 5.

In Fig. 1, a sheet 7 is being stripped from the drum 5 by the stripping mechanism which comprises a stripping bar 8 which, in accordance with the prior application hereinbefore mentioned, operates in timed relation with the rotation of the drum 5 to direct the forward end of the sheet 7 to a pair of stripping rollers 9 and 10. The stripping bar 8 is carried on a shaft 8a journalled in side frames 11 and 12 of the duplicating machine. A spring 8b moves the stripping bar 8 into position to intercept the forward edge of a sheet 7 on the drum 5. Suitable means (not shown) on the drum and the shaft 8a move the bar 8 out to the position shown in Fig. 1 to bring the intercepted forward edge of the sheet 7 between the rollers 9 and 10.

The stripping roller 9 is a knurled metal roller and is journalled in a pair of side frames 11 and 12. The stripping roller 10 is made of rubber and is mounted upon a shaft 13 which is also journalled in the side frames 11 and 12 and which is provided with a suitable gear 14. The shaft 13 is driven by suitable gearing (not shown) in timed relation to the drum 5 so as to continually rotate the lower roller 10 when the drum 5 is rotating. In the present device, the roller 10 is divided into a plurality of sections 10a, 10b, 10c, and 10d (see Fig. 2), leaving spaced grooves or reduced sections between the several sections of the rollers.

A shaft 15 is pivoted in the side frames 11 and 12 and carries a plurality of guide fingers 16, 17, and 18 which are fixed on the shaft 15 by suitable

hubs on the guide fingers and pins passing through the hubs into the shaft 15. These guide fingers 16, 17, and 18 extend into the grooves between the several sections of the roller 10 and are provided with suitable rollers such as 19, 20, and 21 for engaging the under surface of the sheet 7 to prevent this sheet from winding around the rubber roller 10.

Means is provided whereby the position of the guide fingers 16, 17, and 18 with respect to the roller 10 may be varied, and this means comprises an arm 22 forming an extension of the guide finger 17, a link 23 secured to the lower end of the arm 22, and provided with a downturned extremity 24 which extremity is apertured to receive a reduced end 25 on an adjusting screw 26. The adjusting screw 26 is threaded through a cross frame member 27 of the duplicating machine so that it may be adjusted to move the downturned end 24 of the link 23 with respect to the frame member 27. A lock nut 28 is provided on the screw 26 for holding it in any desired position. When the member 24 is moved away from the frame member 27, it operates through the link 23 and the arm 22 to move the shaft 15 and to bring the guide fingers 16, 17, and 18 closer to the axis of the roller 10.

The guide finger 17 in addition to the roller 20 thereon carries a cutting disk 30 adapted to cooperate with a second cutter disk 31 for the purpose of slitting a wide sheet 7 as it is stripped from the drum 5. It is sometimes desirable in machines of this character to make the copies on a wide sheet which is the full width of the drum although the ultimate copy need be only half the width of the drum. An example of such a case is where the message to be duplicated may be so narrow that it can be placed on the gelatin band twice without exceeding the width of the band. Then, upon a single rotation of the duplicating drum, two copies of the same message may be made. By utilizing a wide copy sheet and by slitting the same down the center, the feeding and stripping of the copy sheet can be readily accomplished without the necessity of feeding two copy sheets side by side to the drum. The cutter disk 31 is mounted upon a shaft 32 which shaft is journalled at its opposite ends in arms 33 and 34 which are fixed on a cross bar 35, the cross bar 35 being secured in any suitable fashion to the side frames 11 and 12. A gear 36 is fixed on the shaft 32 and meshes with the gear 14 on the shaft 13.

The cutter disk 31 has a friction roller 37 beside it which friction roller cooperates with the roller 20 to feed the paper sheet 7 between the cutter disks 30 and 31. The cutter disk 31 and its roller 37 are slidable endwise along the shaft 32, but are splined thereto so that they must rotate with this shaft.

In the normal operation of the cutting device comprising the two cutter disks 30 and 31, these disks are in the position shown in Fig. 2. When it is desired to separate the cutter disks for the purpose of running full width sheets, the cutter disk 31 and its roller 37 are moved into the position shown in Fig. 3 so as to permit the sheet 7 to pass between the cutter disks without being slit.

The shaft 32 has thereon a collar 38 and a spring 39 abutting this collar and abutting a hub 40 of the roller 37 so as to yieldingly urge the cutting disk 31 into cutting position. Upon the cross bar 35, a bracket 41 is slidably mounted, and this bracket has a depending lug 42 adapted to engage a shoulder 43 on the cutting disk 31 for moving the cutting disk and its associated roller 37 into inoperative position against the tension of the spring 39.

For moving the bracket 41 on the bar 35, a cam 44 is pivoted by means of a suitable pin 45 on the bar 35 and carries a finger piece 46 for moving the cam 44. A stop pin 47 is provided on the bar 35 for limiting the movement of the cam in one direction. When the finger piece 46 is moved to move the cam in the other direction, the cam can be advanced until its point lies directly against the bracket 41. A suitable set screw 48 is provided on the bracket 41 for locking it to the bar 35 whenever it is desired to operate the machine without using the cutting device.

The bar 35 also carries a pair of guide fingers 50 and 51 which extend rearwardly so as to direct the sheet 7 downwardly onto a receiving tray 52. The bracket 41 has a guide finger 53 similar to guide fingers 50 and 51 riveted thereto, this guide finger being somewhat wider than the fingers 50 and 51 so as to make contact with the adjacent edges of two sheets formed by slitting a sheet 7.

In order to separate the slit sheets in the receiving tray 52, a removable partition 54 is provided. This partition comprises a sheet of metal gradually increasing in depth from the front end of the receiving tray 52 rearwardly. This sheet of metal has depending tongues 55 and 56 which project through suitable slots 57 and 58 in the bottom of the receiving tray 52 and which are guided between angle irons such as 59 and 60 secured to the under side of the receiving tray 52 in any suitable fashion, as for example, by spot welding. These angle irons brace the tongues 55 and 56 and hold the plate 54 in upright position. The receiving tray 52 at its forward end is provided with suitable depending brackets 61 which brackets ride upon the shaft 15 to support the receiving tray, the bottom of the receiving tray being cut away as indicated at 62 (see Fig. 6) for the passage of the guide fingers 16, 17, and 18 therethrough.

While certain embodiments of the invention have been shown and described, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is the intention to claim all novelty inherent in the invention as broadly as possible in view of the prior art.

The invention having thus been described, what is claimed as new and desired to be secured by Letters Patent is:

1. In a duplicating machine of the character described, a duplicating drum, upper and lower stripping rollers for stripping sheets from said drum, and means to prevent the sheets from winding on the lower roller comprising guide fingers between the ends of said lower roller on the side thereof opposite the drum, said lower roller being provided with spaced annular grooves into which said guide fingers project to guide the stripped sheets away from said lower roller one of said guide fingers having sheet cutting means thereon.

2. In a duplicating machine of the character described, a duplicating drum, upper and lower stripping rollers for stripping sheets from said drum, and means to prevent the sheets from winding on the lower roller comprising guide fingers between the ends of said lower roller on

the side thereof opposite the drum, said lower roller being provided with spaced annular grooves into which said guide fingers project to guide the stripped sheets away from said lower roller, a member carrying said fingers one of said fingers having sheet cutting means thereon, and means for adjusting said member to position said fingers with respect to said lower roller.

3. In a duplicating machine of the character described, a duplicating drum, upper and lower stripping rollers for stripping sheets from said drum, and means to prevent the sheets from winding on the lower roller comprising guide fingers between the ends of said lower roller on the side thereof opposite the drum, said lower roller being provided with spaced annular grooves into which said guide fingers project to guide the stripped sheets away from said lower roller, one of said fingers having a sheet cutter thereon and a second cutter cooperating with said cutter to slit sheets as they are stripped from said drum.

4. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk.

5. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk, said forcing means comprising a second cutting disk.

6. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk, said forcing means comprising a second cutting disk, said cutting disks having feeding rollers rotating with them for advancing a sheet between them.

7. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk, said forcing means comprising a second cutting disk, one of said cutting disks being movable axially to separate them.

8. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk, said forcing means comprising a second cutting disk, one of said cutting disks being movable axially to separate them, spring means acting on said movable disk for holding said disks in cutting relation and means for separating said disks.

9. In a duplicating machine having a duplicating surface and a pair of stripping rollers for removing sheets from said surface, means for slitting sheets as they are removed by said rollers comprising a cutter disk in the path of a sheet as it leaves said rollers, means for forcing the sheet against said disk, and means drivingly connecting said disk with one of said rollers whereby to rotate said disk, said forcing means comprising a second cutting disk, said cutting disks having feeding rollers rotating with them for advancing a sheet between them, one of said cutting disks being movable axially to separate them.

10. In a duplicating machine having a duplicating surface, mechanism for removing sheets from said surface comprising a pair of stripping rollers, one of said rollers being divided into a plurality of roller sections for engaging the sheets, said sections being spaced axially from each other, and paper cutting means adjacent said rollers adapted to cut a sheet as it is discharged from said rollers, said cutting means comprising a cutting device located between two adjacent sections of said divided roller.

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