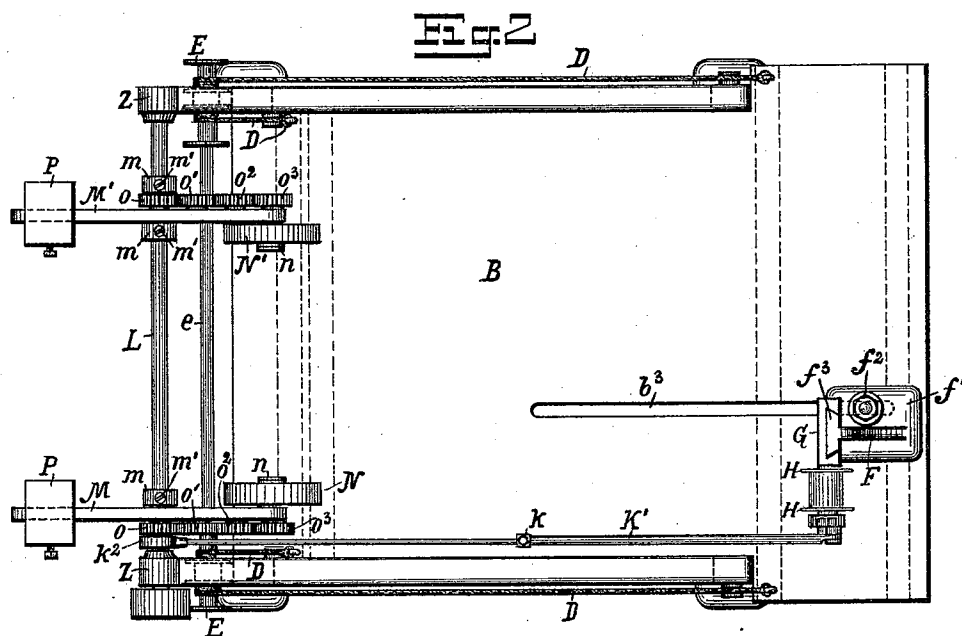
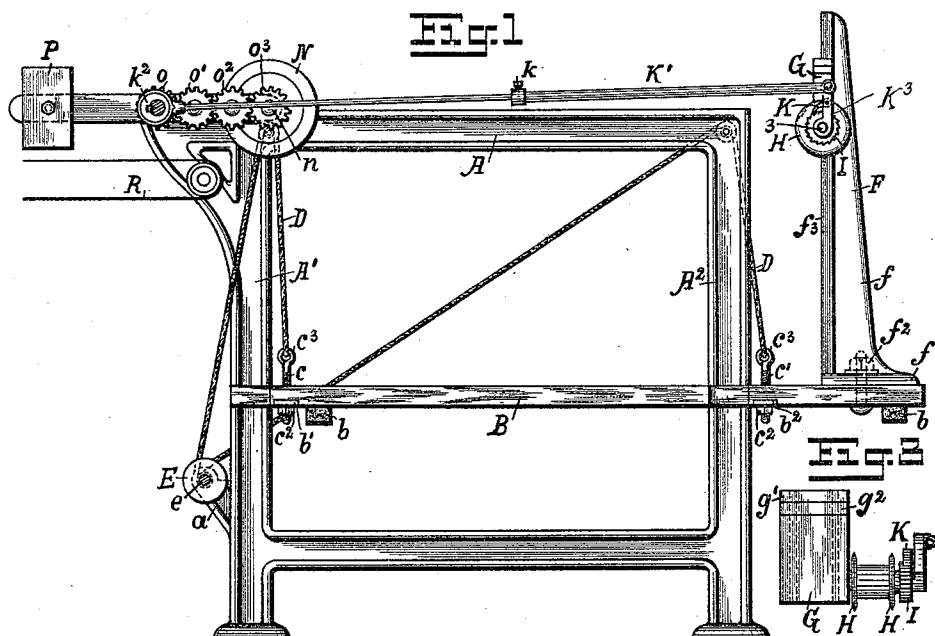


(No Model.)

N. E. FUNK.
SHEET SEPARATING DEVICE.

No. 538,251.

Patented Apr. 30, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

NELSON E. FUNK, OF ELKHART, INDIANA.

SHEET-SEPARATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 538,251, dated April 30, 1895.

Application filed January 27, 1894. Serial No. 498,229. (No model.)

To all whom it may concern:

Be it known that I, NELSON E. FUNK, a citizen of the United States, and a resident of Elkhart, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

My invention relates to that class of machines for feeding sheets of paper and similar material arranged in quantities upon a support or table for either ruling, printing or otherwise operating upon the same.

My invention is better adapted to different materials and different conditions of material than are other machines employing some of the instrumentalities employed and not broadly claimed by me.

The object of my invention is primarily to provide a machine which will operate to firmly hold the bottom sheets of the pile at the rear end thereof by a novel means, while the top sheet may be easily pulled away from the pile in any well known or preferred manner.

The object of my invention is furthermore, to provide a machine of few and simple parts, easily adjusted and repaired, and effective and reliable in operation whether few or many sheets are placed upon the table; and my improvement consists in various improved parts and combinations of parts hereinafter more fully described.

In the accompanying drawings:—Figure 1, is a side elevation of a machine embodying my inventions with the frame partly broken away at its forward and upper end; Fig. 2, a plan of the same, and Fig. 3, a detail of the cutting disk and sliding block to which the same is attached.

The frame A consists of side pieces A', A², bolted to the base or to suitable transverse pieces not shown.

A vertically adjustable table B is supported and guided between the side pieces A', A², which holds a sufficient quantity of paper piled in sheets to be acted upon at one run of the machine. The table B, has transverse cleats b, at its ends and under side and also has transverse plates b', b², upon its under side and arranged closely in rear of the forward and rear standards of the frame side

pieces A', A², which serve to sustain the weight of the table and prevent it from swinging forward. Suspension bolts c, c', are screw threaded and pass through the ends of the plates b', b², and are fitted at their lower ends with nuts c², for their adjustment and at their upper ends with eyes c³ to receive the ends of cables D, D, which pass over and are supported upon small sheave pulleys, at the upper ends and corners of the frame and pass downwardly and forwardly to sheave pulleys E, supported upon a shaft e, held in bearings a, at the lower and forward ends of the frame standards, the said sheave pulleys being arranged in pairs upon opposite sides of the frame standards to prevent their interfering one with the other. The shaft e of the sheave pulleys may be operated at suitable intervals either by an attendant or from a driving shaft of the machine in any well known or preferred manner.

The table B, has a longitudinal slot b³, extending from the middle portion nearly to the rear end thereof, and an adjustable standard F, having an upright f, of T shaped cross section, and a base f', resting upon the table and receiving a bolt and nut f², which passes through the slot and base and is thereby adjusted and held thereon. The transverse plate f³ of the standard F, bears against the rear end of the material piled upon the table and holds it in a true vertical line and serves also to guide a block G dove-tailed to fit and slide freely thereon. A stud pin 3, is secured to and projects from the side of the block G, and carries a rotary disk or disks H, which latter is thus held at all times and permitted to rest with sufficient weight upon the upper and rear end of the pile of paper upon the table, and additional weights g', g², may be placed upon the block G, to hold the cutting disk H, down with increased force to pass through other kinds of material.

A ratchet wheel I, is secured to the hub of the disk H, and a pawl K, supported upon the free end of a rocking arm K², turning upon the pin 3, and partly rotates the disk H, at suitable intervals to cut through the upper sheet of the pile in time to admit of its being freely drawn from the forward end by means hereinafter described without permitting the

other sheet or sheets below to be drawn along with the upper sheet.

The rocking arm K^3 , is adjustably connected by a sectional extension rod K' held together by a set screw k , with an eccentric k^2 , secured to and turning with a driving shaft L supported in bearings Z , at the upper and forward end of the frame, and driven in any well known or suitable manner, from the machine of which this is an attachment. Upon the shaft L , are also secured two independently moving arms M , M' , either or both of which may be adjusted by means of collars m , and set screws m' , in a well known manner, to oscillate freely upon the shaft, and each carrying at its rear end a freely revolving friction wheel N , N' , which rests upon the side margins of the upper sheet of paper and is caused to revolve by means of a train of gear wheels O , O' , O^2 , O^3 , with the shaft n of the said friction wheels thus imparting to them a uniform equal and positive motion and causing them to draw the upper sheet of paper by frictional contact with a firm and steady movement to the forward end and away from the cutting disk or disks at the rear end of the machine.

It will be seen that the gear wheel O , is secured to the driving shaft and the gear wheel O^3 , is secured to the shafts n , of the friction wheels and together with the intermediate gear wheels O' , O^2 , also supported by studs upon oscillating arms M , M' , move freely and independently with said arms to permit the rubber wheels to bear independently of each other upon the margin of the paper and at the same time be driven at a uniform speed.

The forward ends of the arms M , M' , have counter balance weights P , adjustably secured thereon which will so balance the weight of the friction wheels N , N' , that each may bear upon the paper with such delicacy of touch as to cause each succeeding upper sheet only to be drawn forward by the friction rollers; the weight of the cutting disks H being also so adjusted as hereinafter described to secure a corresponding delicacy of pressure upon the rear edge of the said upper sheet and permit it to be more freely pulled forward, a positive cut in the upper sheet having been secured by the short positive rotation of the cutting disk as hereinafter described by means which also adjust themselves with the free downward movement of the cutting disks and the gravity block G upon which one of said means are supported. This nice adjustment of the friction wheels and cutting disks, to rest upon the successive upper sheets with a uniformity of pressure will continue while a more delicate self adjustment of the table with the load of material upon it is admissible without frequent changing of the adjustments of the machine from time to time because of the friction wheels and paper holding and cutting disk adjusting themselves independently of the table adjustment. The paper is carried away from the machine and delivered to the print-

ing press or place where it is to be operated upon by a belt R , or other suitable conveyer after it has left the friction or presser rolls.

The operation of the machine will be readily understood from the foregoing description which in detail has been described in connection with the several instrumentalities peculiar to my invention.

The intermittent rotary cutting disk or disks H , are not required to be lifted from the paper and when in operation will cut clear through the upper sheet as it revolves and as the paper is withdrawn, while with other rotary spur wheels the paper is held firmly down by the spur or "bearing point," or "non-penetrating point" to tear out a chip from the edge of the paper while the rotation of the spur wheel or the lifting of the paper holder is caused to allow the preceding chip to be removed from the sheet of paper upon which it rests.

The independent vertically adjustable friction rollers, each driven positively at a uniform speed performs a most important function in the proper working of a machine requiring such nice adjustments.

The independently moving friction feed rollers, may be driven more positively with greater uniformity and precision by the gearing attached to the shaft upon which the roller bearing arms are supported, than by belts and independently non-concentric shafts varying constantly the tension upon the belts as the rollers rise and fall to adjust themselves to the varying height of the pile of paper upon the table, and the adjustment of both the table upon which the paper rests and the friction feed rollers and gravity paper holder have not been heretofore used together to act conjointly and provide not only an exceedingly sensitive and delicate self adjustment of the friction feed rollers and paper holder, but also permit a much larger quantity of paper to be placed upon the table without affecting the delicacy of action of the paper feeding and holding devices, and without requiring frequent changing of the adjustment of the machine.

I do not broadly claim or use a non-revolving gravity paper holding cutter, or a revolving non-cutting paper holder. Neither do I claim singly or broadly any other of the instrumentalities herein shown and described.

I claim as my invention and desire to secure by Letters Patent—

1. A paper feeding machine comprising a table to receive a quantity of sheets of paper or similar material, a feed mechanism to act upon said material at the forward end of the machine, and an intermittently rotated cutting disk resting continuously thereon to cut through the upper of said sheets near the rear edge thereof when turned, and to cut through the remainder of the material at the edge of the upper sheet by the pull of the feed mechanism, substantially as described.

2. A paper feeding machine comprising a

table to support the sheets of paper or similar material, a feed mechanism to act upon the material at the forward end of the machine, a rotary cutting disk H, ratchet wheel
5 I, pawl K, rocking arm K² block G supported in standard F, an adjustable connecting rod and a driving shaft for operating the same, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in the to presence of two subscribing witnesses.

NELSON E. FUNK.

Witnesses:

GEORGE OLTSCH,
O. B. REICHELT.