

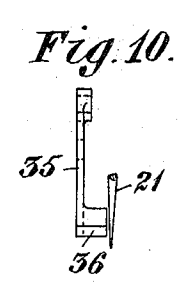
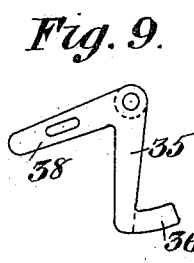
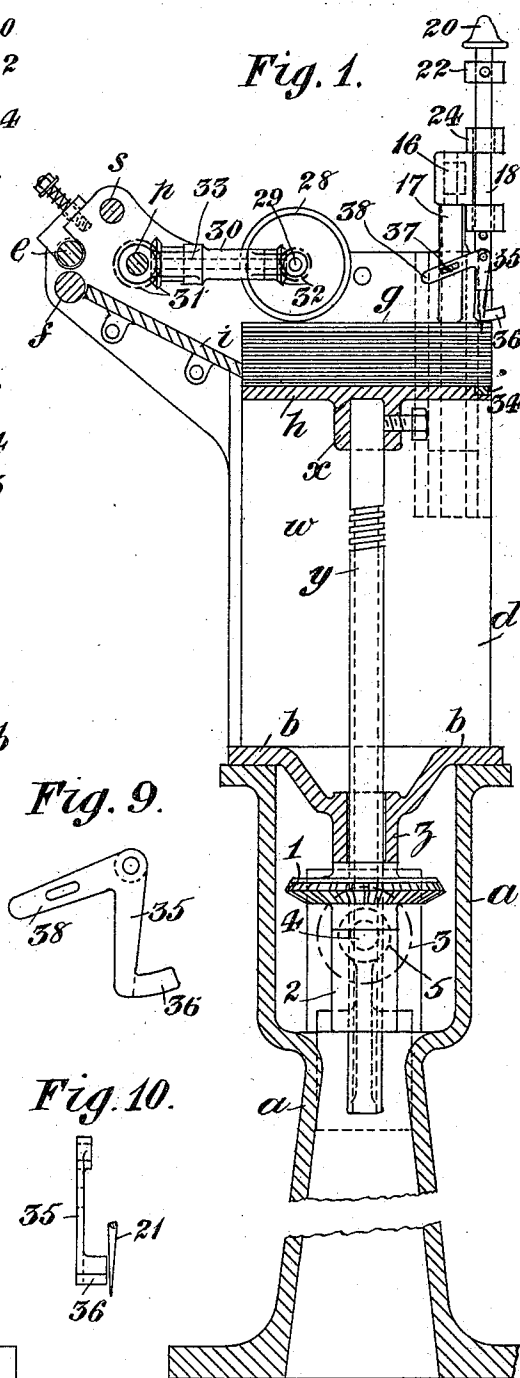
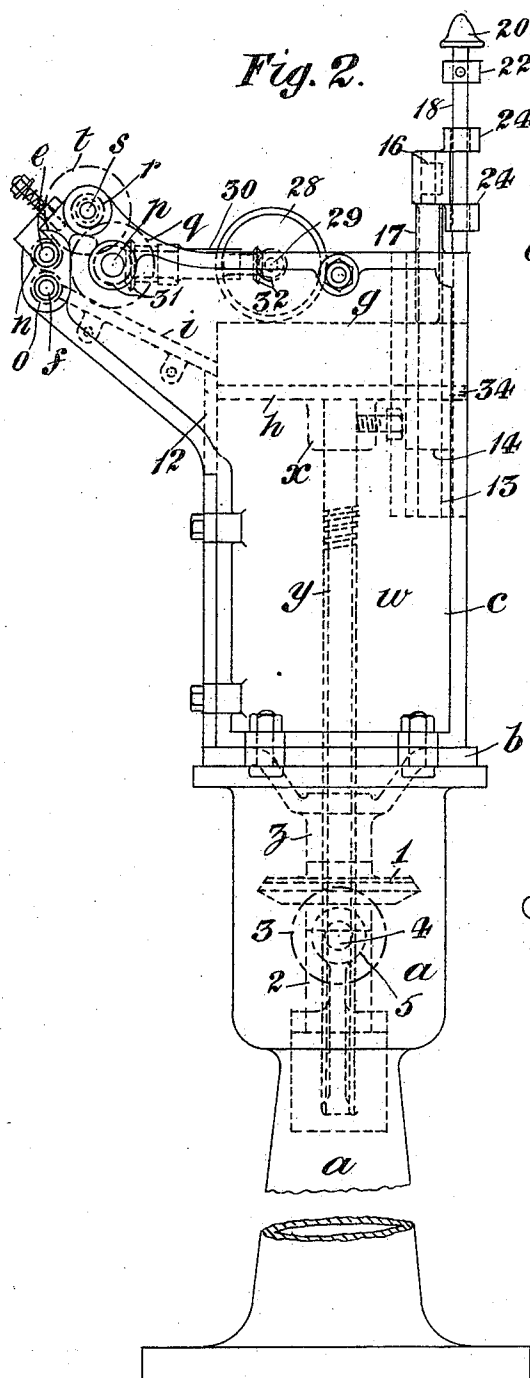
A. F. DAWES, P. C. OLSEN & A. DAY.
MACHINE FOR FEEDING AND DELIVERING SHEETS OF PAPER.

APPLICATION FILED OCT. 28, 1907.

Patented Jan. 10, 1911.

981,538.

3 SHEETS—SHEET 1.



Witnesses:
William Sadler
Anne Park

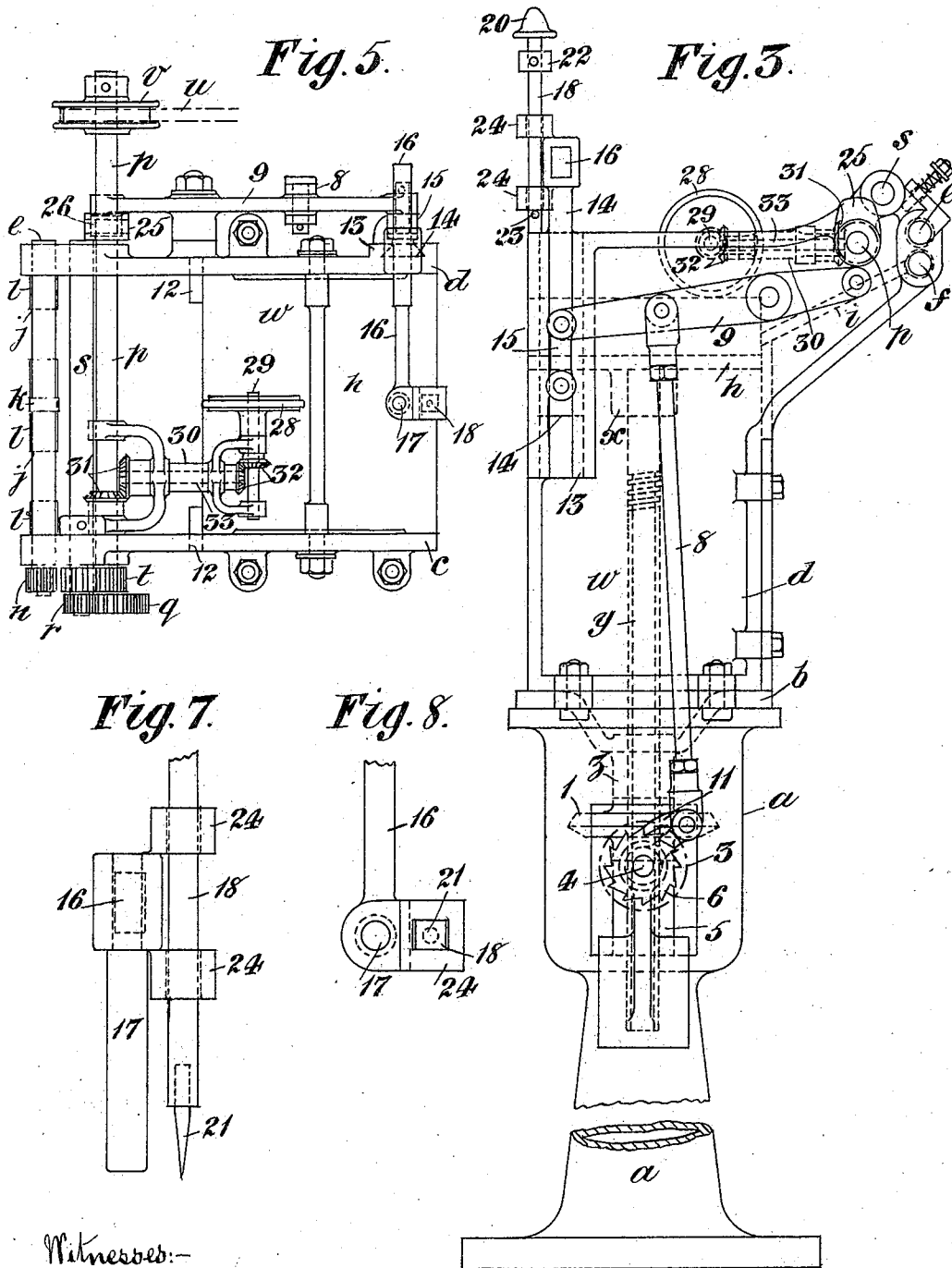
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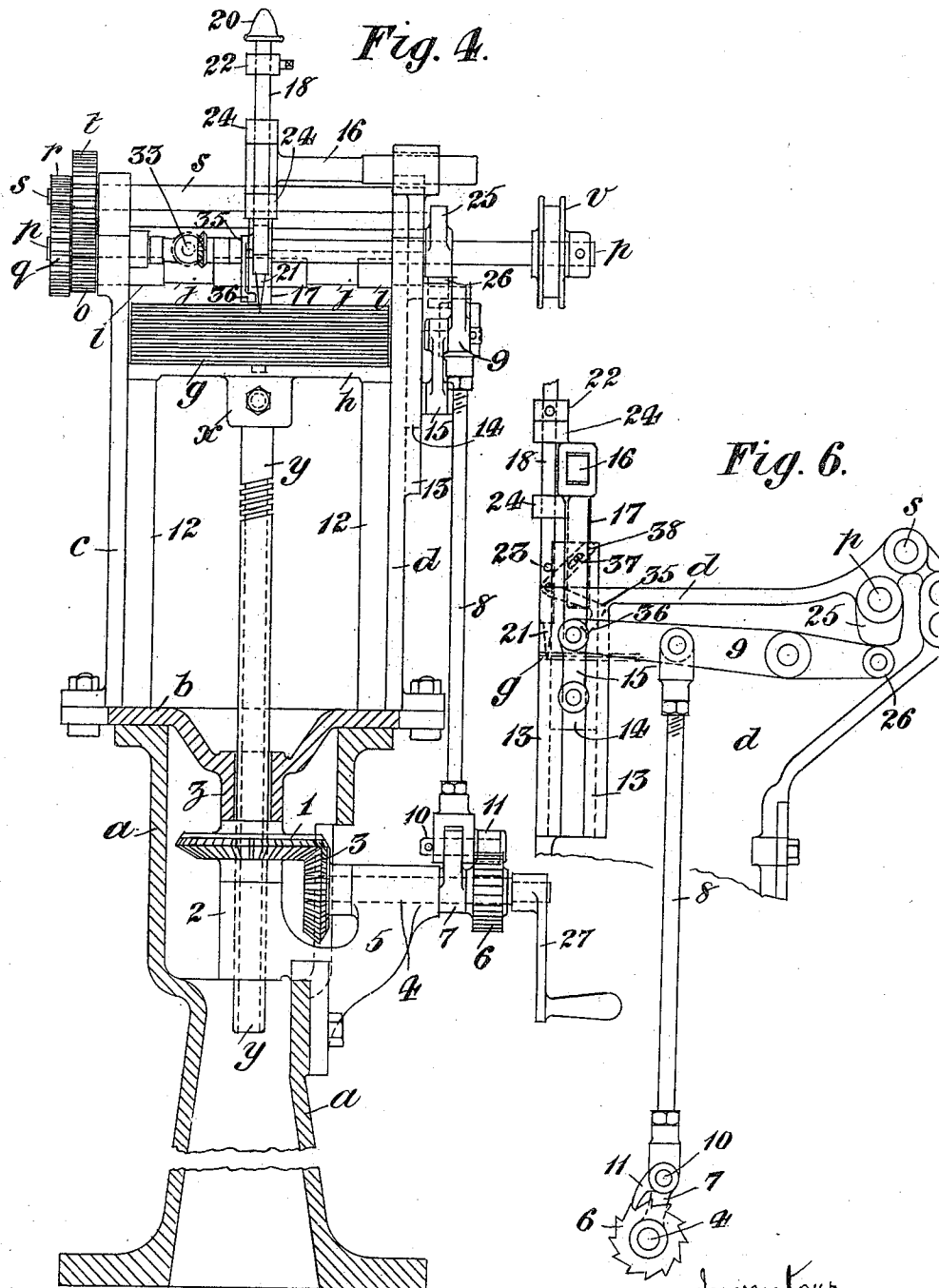
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3 SHEETS—SHEET 3.



Witnesses:-
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UNITED STATES PATENT OFFICE.

AUGUSTUS FREDERICK DAWES, OF MANOR PARK, PETER CHRISTIAN OLSEN, OF CLAPHAM PARK, AND ALBERT DAY, OF HARRINGAY, LONDON, ENGLAND.

MACHINE FOR FEEDING AND DELIVERING SHEETS OF PAPER.

981,538.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed October 23, 1907. Serial No. 399,565.

To all whom it may concern:

Be it known that we, AUGUSTUS FREDERICK DAWES, a subject of the King of England, residing at 33 Second avenue, Manor Park, in the county of Essex, England, manager, PETER CHRISTIAN OLSEN, a subject of the King of Denmark, residing at 1 Coverdale road, Clapham Park, in the county of Surrey, England, engineer, and ALBERT DAY, a subject of the King of England, residing at 85 Hewitt road, Haringay, N, London, in the county of Middlesex, England, chemical manufacturer, have invented new and useful Improvements in Machines for Feeding and Delivering Sheets of Paper, of which the following is a specification.

This invention relates to improvements in apparatus for automatically feeding, conveying, and delivering sheets or strips, hereafter termed "sheets,"—of paper to the table or reciprocating carriers, or molds or pasting devices,—all of which are hereafter termed and included in the term "table or other device,"—of, say, bag forming, or pasting, or labeling, or printing, or other like machines.

The objects of this invention are, first, to provide means for enabling a sheet of paper to be fed singly and in regular order from a pile up a fixed or adjustable incline, on to the table or other device; second, to automatically adjust the bottom of the receptacle for the sheets to the incline and feeding mechanism; and third, to retain the sheets in the desired position in the pile and to release them singly therefrom, and at the same time to remove any obstruction that would retard the efficient working of the said retaining and separating mechanism.

The hereinafter described mechanism is mounted and fixed on separate framework independently of any of the above named machines, and it is arranged in any suitable position thereto that will permit of it being driven by, say, pulleys or belts, or chains and sprocket wheels, or shafts and gearing from a convenient rotating part of any such machines, as well as enabling it to deliver a sheet on to the said table or other device.

We attain these objects by mechanism illustrated in the annexed sheets of drawings in which:—

Figure 1. is a sectional elevation of a machine constructed according to this inven-

tion. Fig. 2. a side elevation of the same. Fig. 3. a side elevation of the opposite side of the machine to that shown at Fig. 2. Fig. 4. a part front and part sectional elevation of the machine. Fig. 5. a plan looking at the top. Fig. 6. an enlarged elevation showing the mechanism for operating the presser bar. Fig. 7. an elevation of presser bar and needle bar. Fig. 8. a part plan of same. Fig. 9. an enlarged elevation of paper clearing lever. Fig. 10. an end elevation of the same.

Like parts in all the views are marked with similar letters of reference.

On a suitable stand or pillar, or framework, hereafter termed "stand *a*," is fixed a horizontal plate or table, hereafter termed "a plate *b*." On the said plate *b* is fixed, adjustably or otherwise,—at a suitable distance apart, the two cheeks or sides *c*, *d*, of the framework of the feeding mechanism. The said cheeks or sides of the framework are made of any suitable size, depth, and shape and provision is made in them for the reception of the drawing rollers *e*, *f*, the sheets *g* to be automatically fed arranged in a pile, the adjustable bottom for the sheets, and the means,—to be hereafter described,—for retaining them in position, and for feeding them up a fixed or adjustable incline *i* to the drawing rollers. The drawing rollers *e*, *f*, may, or may not, have suitably grooved or recessed portions as shown at *j*, Fig. 5, and may be provided with one or more projecting rings *k*, *l*, for drawing the sheets between them. That is to say, the top roller *e* is provided with a ring *k* at or about its center, and the bottom roller with three (more or less) rings *l*, having a recessed portion *j* between them.

The rollers *e*, *f*, are suitably geared together by spur wheels *n*, *o*, as well as to a driving shaft *p* by means of a spur wheel *q* gearing with a pinion *r* mounted upon a spindle or shaft *s* which is geared by spur wheel *t* to the spur wheel *n* on the shaft of the roller *e*. The driving shaft receives a rotary motion from a moving part, say, of a bag forming, or other machine by any of the hereinbefore mentioned means, as for example, say, by belt *u* working over flanged pulley *v* fixed upon the driving shaft *p*.

The incline *i* for directing the sheet from the pile to the drawing rollers is fixed as at

Fig. 1. When the incline i is a fixture it is secured to the sides $c d$ by bolts so as to be at a predetermined angle to the rollers $e f$ as well as to the plate h . If desired the lowest end or edge of the incline i is arranged to be at a suitable distance from the upper edge of the said plate. When this is done a vertical and transverse plate 12 is provided to prevent the sheets passing under the incline.

At Figs. 1 to 5 the incline is shown to extend the full distance between the sides $c d$. The box or portion of the framework w in which the pile g of paper is placed is shaped according to the contour of the sheets to be fed. The box w is provided with a movable bottom h provided with a boss x , in which is fitted and secured the upper end of a vertical screw shaft y arranged to pass through boss z formed on the underside of plate b .

Below the boss z is mounted a bevel wheel 1 on the screw shaft y . The boss of the bevel wheel 1 forms a nut for the screw thread portion of the shaft y .

The bevel wheel 1 is mounted on the screw shaft y in the space between the boss z and the vertical boss of a bracket 2. The screw shaft y which has a screw thread cut thereon for the major portion of its length, is made to pass through both the bosses z and 2, as shown at Fig. 4. A second bevel wheel 3 is made to gear with bevel wheel 1. The wheel 3 is fixed upon a spindle or shaft 4 mounted horizontally in the bearing 5 forming part of bracket 2 which is fixed to the stand a . The bracket 2 is thus provided with two bosses or bearings, one a vertical boss and the other a horizontal one. On the outer end of the shaft 4 is fixed a ratchet wheel 6, and between it and the bearing 5, a lever 7 is mounted loosely upon the said shaft. The upper end of the lever 7 is connected by an adjustable connecting rod 8 to a double ended lever 9 fulcrumed to the side d . On the pin 10 that attaches the bifurcated end of the connecting rod 8 to lever 7 is mounted a pawl 11 adapted to engage with the teeth of the ratchet wheel 6, by which an intermittent rotary motion is imparted to the shaft 4 and bevel wheels 1, 3, for raising and lowering the adjustable bottom h . The bottom h is arranged to slide up and down between the guides 12, which also aids in keeping the pile of sheets g in position. The movable bottom may, in the first instance, be raised to and from its work by hand or power.

To the outer face of the side d is cast or fixed at its upper end guides 13, for a slide 14, provided with tapering sides to fit the guides. The outer end of the lever 9 is connected by a link 15 to the slide 14. The upper end of the said slide is enlarged and provided with a rectangular shaped hole adapted to receive an adjustable horizontal bar 16. The outer end of the bar 16 is en-

larged to form a semicircular boss with a flat side (Fig. 8) in which is pendent mounted and fixed the presser bar 17 by a set screw (not shown in the drawings) or other suitable means. The presser bar 17 rests upon the top of the pile of sheets g . If so desired,—but not necessarily so,—the presser bar 17 and horizontal bar 16 may be made in one instead of two portions.

To the horizontal bar 16 is fixed,—adjustably or otherwise,—a number,—say, two,—of bosses which form bearings 24, or the bearings 24 form part of the bar 16 and project therefrom above and below this enlarged end as shown at Figs. 7 and 8. In the bearings 24 a vertical rod 18 is made to slide. The vertical rod 18 is weighted at 20 and its lower end is armed or has fixed thereto a needle or pin or knife 21 which passes through two or more sheets of paper for preventing more than one sheet being removed at one time from the pile. The downward movement of the rod 18 is regulated by an adjustable collar 22, which is mounted upon the rod 18, above the upper bearing 24. At certain portions of the intermittent falling of the presser bar 17 the vertical rod 18 as a rule remains stationary with the pin in the pile; but if desired provision may be made for raising it when the surface of one of the bearings 24 comes in contact with the adjustable collar 22. An adjustable or other pin 23 is fixed or mounted upon the vertical rod 18 at a distance from the collar 22, whereby the needle 21 may be pressed into the paper when the lower bearing 24 comes in contact with the pin 23.

An intermittent reciprocating motion is imparted to the slide 14 by means of a cam 25, mounted upon the driving shaft p arranged to act upon a runner 26 on the short end of lever 9 and by the opposite end of the same lever being connected by link 15 to the slide. The presser bar is slightly raised while the feed wheel 28 is drawing a sheet away from pin or needle 21 and causing it to travel up the incline. Afterward the presser bar descends upon the pile g . Simultaneously with the reciprocation of the slide 14 the adjustable bottom h is caused to be intermittently moved in an upward direction, owing to the pawl 11 and lever 7 being connected by rod 8 to the lever 9 upon which the cam 25 operates. On the rod 8 being moved downward the pawl 11 by its engagement with the teeth of the ratchet wheel 6 imparts an intermittent rotary motion to the shaft 4 and bevel wheels 1 and 3 for raising the screw shaft y and adjustable bottom h . This upward movement of the shaft y is obtained by arranging the boss of the bevel wheel 1 to act as a rotary nut for the screw threaded portion of the said shaft. The adjustable bottom h is returned to its normal position,—say, its lowest position be-

tween the guides 12 by means of a fixed or removable handle 27,—shown at Fig. 4,—which is employed for rotating the shaft 4 and bevel wheels 1 and 3 when the pawl 11 is disengaged from the teeth of the ratchet wheel 6.

The sheets of paper *g* are fed singly from the pile to the rollers *e, f*, by a feed wheel 28,—with or without a rubber or other elastic tire,—fixed upon a horizontal spindle or short shaft 29. The spindle 29 is mounted in axial bearings at the lower end of a swinging carrier 30. The swinging carrier 30 is bifurcated at each end in which bifurcations are formed axial bearings. The upper end of the carrier is mounted to swing freely upon the driving shaft *p* so that the periphery of the feed wheel 28 will rest upon and move downward with the pile of sheets *g*. A rotary motion is imparted from the driving shaft *p* to the feed wheel 28 by means of two pairs of bevel wheels 31, 32, mounted respectively upon the driving shaft *p*, horizontal spindle 29, and upon opposite ends of an intermediate spindle or short shaft 33 carried by the carrier 30 at or about a right angle to the driving shaft and horizontal spindle.

The feed wheel 28 is arranged by its rotation to draw the sheet of paper up the incline *i* and thus away from the said pin 21. If required, the movable bottom *h* may be plugged at 34 (Fig. 1) with hard wood at the point where the pin 21 is liable to come in contact with it. In order to remove any paper that might adhere to the pin 21 after a sheet has been fed forward, to the vertical rod 18 is pivoted a swinging lever 35 (Figs. 9 and 10) provided with an enlarged free end 36 for clearing the point of the pin 21 from any incumbrance. The enlarged end 36 of the said swinging lever is timed to pass behind the pin 21 each time the presser bar 17 is raised by a pin or projection 37 on the former acting upon a projection or arm 38,—or a slot hole therein,—fixed to or forming part of the rear of the swinging lever 35. The pin or projection 37 which acts upon the rear portion 38 of the lever 35 moves its enlarged front portion 36 forward for removing any obstruction or paper that may have been left adhering to the pin or knife 21.

When the machine is employed for feeding unpasted sheets of paper to, say, printing or bag forming machines, then each sheet of paper is fed up the incline *i* and passes between the rollers *e, f*, as at Fig. 1, and it is delivered directly on to, say, the table of the machine.

The action of the machine is as follows:—The sheets of paper are placed in a pile within the box portion *w* of the framework and upon the adjustable bottom *h*. The feed wheel 28 is then placed upon the top of the

pile. The pin 21 is then arranged in position. When a rotary motion is imparted to the feed roller 28, the latter by its frictional contact with the pile first separates a sheet by causing it to travel forward away from the pin 21 and, afterward up the incline *i* to and between the rollers *e, f* by which it is drawn forward and passed on to the table of the printing or bag forming, or other machine. Simultaneously with the feeding of a sheet the lever 9 will be acted upon by cam 25 for raising the slide 14 and presser bar 17, during the time the adjustable bottom *h* is being raised by the screw shaft *y* when acted upon by bevel wheels 1 and 3, operated by shaft 4, ratchet wheel 6, pawl 11, lever 7, and connecting rod 8 which is attached to the lever 9. On the descent of the slide 14 and presser bar 17, the enlarged end 36 of lever 35 will be moved forward for clearing away any paper adhering to the point of the pin 21.

We are aware that prior to our invention, machines have been arranged with separating and feeding devices, in which a sloping surface or ridge and a rocking arm carrying a feed wheel have formed important features, also that holding pins and rollers have been made to act upon the pile from which a sheet to be fed has been torn. We therefore do not claim such a combination broadly.

We claim:—

1. In a machine for feeding sheets of paper, the combination of a stand with a recess formed in its top, a plate fixed to the top of the stand, and provided with a pendent boss inserted within the said recess, a pair of side cheeks fixed at a distance apart to the upper surface of said plate, guide plates fixed to said side cheeks, an adjustable bottom, a screw passing through said pendent boss and having the adjustable bottom mounted upon its upper end, means for operating the said screw and bottom, a pair of drawing rollers, and means for causing the sheets to travel to the drawing rollers.

2. In a machine of the character described, a stand, with a recess formed in its top, a plate with a pendent boss adapted to be placed in the said recess and to be secured to the top of the stand, two side cheeks fixed to the top of said plate at distances apart, guide plates fixed to the side cheeks, two drawing rollers mounted in said cheeks, a bracket fixed to the stand and having with two bosses at right angles with each other one of the said bosses passing through an opening in the stand into the said recess, an adjustable bottom having a pendent boss, a screw shaft fixedly secured to the pendent boss, and arranged to pass through the two bosses in the recess of the stand, a bevel wheel mounted on the screw shaft in the space between the two said bosses, a driving

shaft, spur wheels for gearing the drawing rollers to the driving shaft, and means for imparting an intermittent rotary motion to the bevel wheel on the screw shaft from the driving shaft for causing the adjustable bottom to rise in its guides.

3. In a machine for feeding sheets of paper the combination of a framework having a pair of rollers mounted in bearings in the framework, a driving shaft mounted in bearings in the framework, spur wheels gearing the driving shaft and rollers together, a table adapted to support a pile of sheets of paper placed in the framework, an incline arranged between the framework and at one end of the said table, and means causing the sheets to travel up the incline to the said rollers, said means comprising a swinging carrier with bifurcated ends and mounted at one end on the driving shaft, a horizontal shaft mounted in the lower bifurcated end of said carrier, a feed wheel mounted on the horizontal shaft, a second shaft mounted in bearings of the swinging carrier at a right angle to the horizontal shaft, bevel gearing mounted respectively upon the driving, horizontal, and the second shaft whereby a rotary motion is imparted from the driving shaft to the feed wheel.

4. In a machine of the character described, the combination of framework having a pair of rollers mounted in said framework, a driving shaft, means for imparting a rotary motion to it, and to the said rollers, a table adapted to support a pile of sheets of paper placed at the rear of the plate in the framework, an incline for conducting a sheet separated from the pile to the rollers, means for separating and causing the sheet to travel up the incline, said means comprising a swinging carrier with

bifurcated ends and mounted at one end on the driving shaft, a horizontal shaft mounted in the lower bifurcated end of said carrier, a feed wheel mounted upon the horizontal shaft, a second shaft mounted in bearings of the swinging carrier at a right angle to the horizontal shaft, beveled gearing mounted respectively upon driving, horizontal, and second shaft whereby a rotary motion is imparted from the driving shaft to the feed wheel, a presser bar and a vertical pin arranged at the rear of the framework for retaining the sheets in position, and means for intermittently raising the same.

5. In a machine of the character described, the combination with the side cheeks, the bottom plate to which the side cheeks are secured, and the driving shaft of the machine, of a cam mounted upon the driving shaft, a double ended lever fulcrumed to one of the side cheeks and upon one end of which the cam acts, a slide mounted vertically in said side cheek, a link for attaching the vertical slide and double ended lever to each other, a carrier for the presser bar, a presser bar adjustably attached by said carrier to said slide, a weighted bar mounted vertically in bearings formed on the presser bar carrier, a pointed pin mounted in the lower end of the said weighted bar, means for adjusting the lift of the said weighted bar, and raising it from the bottom plate, and means for clearing any paper away from the pointed pin.

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