

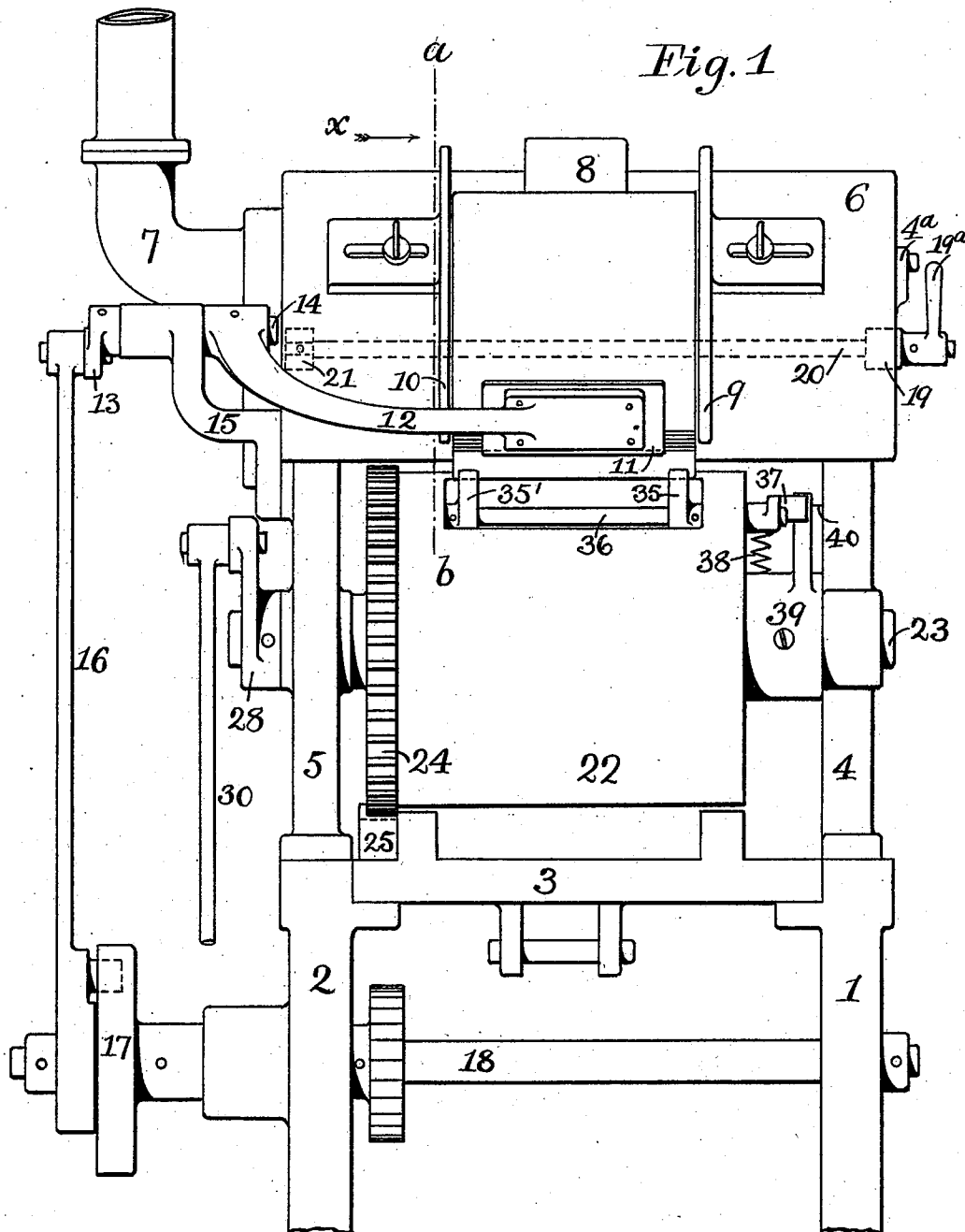
(No Model.)

3 Sheets—Sheet 1.

W. A. LORENZ.
SHEET SEPARATING MACHINE.

No. 570,175.

Patented Oct. 27, 1896.



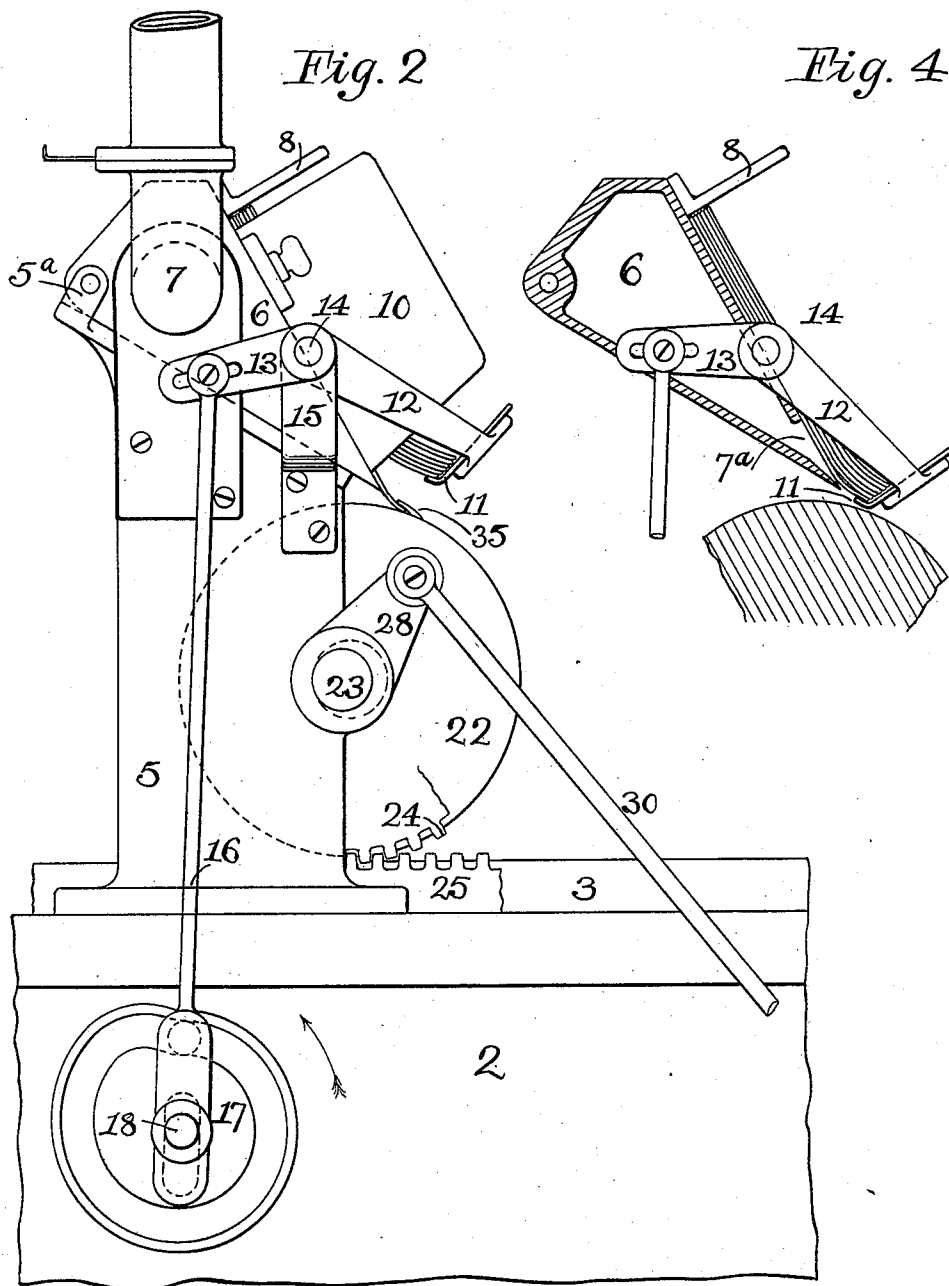
(No Model.)

3 Sheets—Sheet 2.

W. A. LORENZ.
SHEET SEPARATING MACHINE.

No. 570,175.

Patented Oct. 27, 1896.



Witnesses:

Edward E. Claussen.

W. H. Honiss.

Inventor:

William A. Lorenz

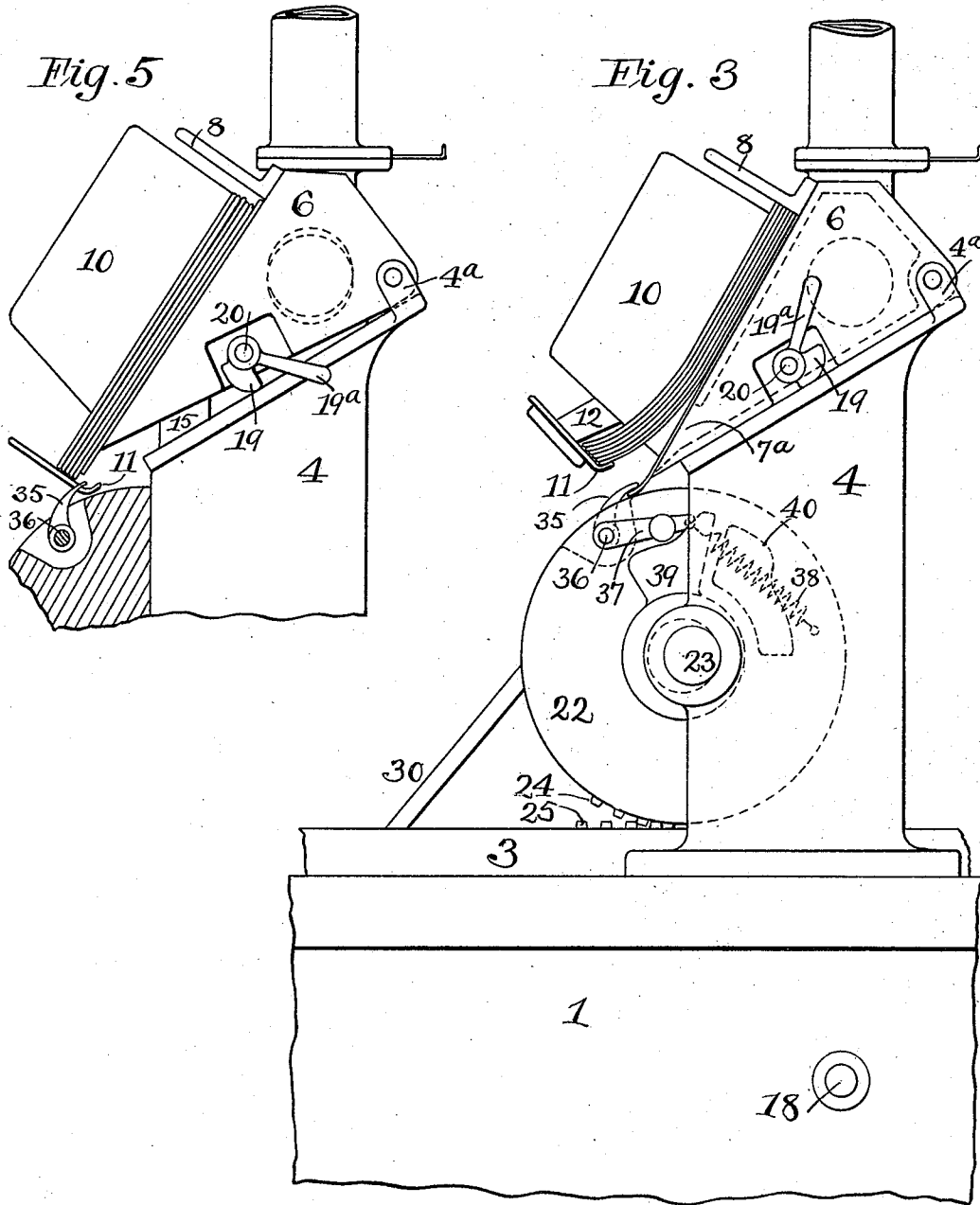
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
CONSOLIDATED S. O. S. BAG COMPANY, OF NEW YORK, N. Y.

SHEET-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,175, dated October 27, 1896.

Application filed January 28, 1895. Serial No. 536,401. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Sheet-Separating Machines, of which the following is a full, clear, and exact specification.

This invention relates to means for automatically separating paper bags, envelopes, sheets of paper, or similar objects from a pile for the purpose of feeding them singly to other mechanism for any purpose.

The arrangement of my invention as described herein and as shown in the accompanying drawings is one which adapts it to be used in connection with a machine of the general form shown and described in Letters Patent of the United States No. 525,999, of September 11, 1894, to Casper Reising.

Figure 1 of the drawings is a front view of a machine embodying my invention. Fig. 2 is a view looking from the left-hand side of Fig. 1, and Fig. 3 is a view looking from the right-hand side of Fig. 1. In these three views enough is shown of the frames and bed of the machine of the Reising patent to enable the relation of my invention thereto to be understood. Fig. 4 is a side view, looking in the direction of the arrow *a*, of a section taken on the line *a a* of Fig. 1, showing enough of the lifter-arm in front of the section to indicate its relation thereto. Fig. 5 is a side view corresponding to the upper portion of Fig. 3, excepting that the parts are shown in their non-feeding position.

The construction and mode of operation of the frames 1 and 2, the type-bed 3, the rack 25, the gear 24, the cylinder 22, the eccentric shaft 23, the arm 28, the rod 30, the gripper 35, its shaft 36, arm 37, spring 38, and cams 39 and 40 are similar to the construction and mode of operation of the correspondingly-numbered parts of the machine shown in the Reising patent above referred to, with the exception that the function of the gripper 35 is herein performed by two similar grippers 35 and 35', located toward the edges of the cylinder.

The cylinder 22 is journaled upon its shaft 23, which in turn is journaled in the brackets

4 and 5. Upon those brackets, at 4^a and 5^a, respectively, is pivoted the vacuum-box 6. A pipe 7, communicating with any suitable air-exhausting mechanism, is attached to the bracket 5 with its face abutting against the side of the vacuum-box. An aperture in the latter is adapted to communicate with the interior of the pipe, the parts being so arranged as to allow of raising the box on its pivots without disturbing the communication between that box and the pipe. The upper wall of the vacuum-box is preferably inclined at a somewhat steep angle, is provided with an opening 7^a, and is adapted, by means of adjustable gage-pieces 8, 9, and 10, to hold a pile of sheets in suitable registering relation to the cylinder. The lower or leading ends of the sheets rest against a lifter 11, which is fixed to the arm 12, and is provided with an angularly-turned edge or lip adapted to support the lower edge of the pile.

The arm 12 and its operating-lever 13 are fixed to the shaft 14, which is journaled in the bracket 15 upon the frame 5. The center of the shaft 14 is preferably located in the plane of the supporting-surface of the table or vacuum-box 6, as the direction of lift will therefore be at right angles to the plane which supports the undermost sheet. The lever 13 is connected by means of the rod 16 with the cam 17, fixed on the shaft 18. That shaft is journaled in the frames 1 and 2 and is connected with the motive power of the machine by gears (not shown) so proportioned as to cause the shaft 18 to make one revolution for each complete reciprocation of the bed and cylinder. The cam 17 is so formed as to cause the arm 12 to oscillate from the position shown in Fig. 4 to that shown in Fig. 2 and back again in suitable time at each revolution of the shaft 18.

The vacuum-box 6 is pivoted upon the frames in order that it may be readily turned over out of the way to enable the operator to get at the cylinder, and also to enable him to instantly stop or start the feeding operation. The cam 19 is pivoted upon the box and is adapted to bear against the bracket or against any convenient abutment, when its handle 19^a is depressed by the hand of the attendant, so as to raise the front or feeding end of the

box to stop the feeding operation, as shown in Fig. 5. It will be obvious that the cam might instead be pivoted upon one or both of the brackets 4 and 5, with its eccentric part bearing against the box to be raised; also that the pivot of the cam may be a long shaft, as 20 in Fig. 1, with a similar cam 21 on the opposite end. The mode of operation of this machine is as follows: The impression devices are "made ready," and the sheets are placed in a pile upon the vacuum-box, the sides 9 and 10 being so adjusted as to bring the sheets into suitable register upon the cylinder. Motion is communicated to the machine, causing the bed and cylinder to reciprocate, as shown and described in the Reising patent above referred to, and causing the devices of my present invention to move in a suitable time and relation thereto. The lower ends of the sheets rest against the plate of the lifter and are supported by the lip formed on the lower edge of that plate. By the operation of the cam 17 the arm 12 with its plate is lowered so that the lower sheet is allowed to rest against and cover the opening 7^a in the upper wall of the vacuum-box, as shown in Fig. 4. Then the plate is raised to the position shown in Figs. 2 and 3, carrying with it all of the sheets excepting the lower one, which is held down by the action of the exhaust, so that its edge is drawn off from the lip of the lifter. After being thus separated from the rest of the sheets it is seized by the grippers 35 35' upon the cylinder 22, and is by them drawn away from beneath the pile and printed or otherwise operated upon. Then the sheets are again lowered by the lifter, and the succeeding sheet is detached, and so on.

When for any reason the attendant desires to stop the feeding operation, the handle 19^a of the cam is depressed and the box is thereby raised on its pivots, as shown in Fig. 5, in which position the sheets are held above the reach of the cylinder-grippers.

The arm 13 is preferably slotted in order that the amount of angular motion of the arm 12 and its plate 11 may be varied to suit different degrees of stiffness in the material to be fed. The upper wall of the vacuum box or table is herein shown and described as being somewhat steeply inclined, and this is my preferred arrangement, inasmuch as a considerable part of the weight of the pile is thereby brought upon the lifting-plate 11,

and the lower sheet is more readily drawn from beneath the pile by the cylinder and its grippers. It will be obvious, however, that the device will also work well with the upper wall horizontal when located in a suitable relation to the cylinder.

It will also be understood that the cylinder and grippers form no essential part of this invention, but that any suitable device for carrying away the separated sheets may be substituted for them.

I am aware that various machines are adapted to elevating a pile of sheets against suction devices, which successively remove the uppermost sheets therefrom, and I do not herein lay claim to such an adaptation. They are objectionable in the respect that it is necessary to stop the feeding operation while replenishing the pile of sheets, whereas in the machine of my present invention the sheets are fed from the bottom of the pile, and more sheets may at any time be added to the top of the pile without interfering with the feeding operation.

I therefore claim as my invention—

1. A sheet-separating device, consisting of a table adapted to support a pile of sheets, having an opening therein connected with air-exhausting means, and a lifter having a lip adapted to catch under one end of the pile, with means for imparting a reciprocating motion to the lifter, all arranged and operating to separate the lower sheet from those above it, as the latter are raised by the lifter.

2. The combination of a sheet-supporting table, having an opening therein, with air-exhausting means operating through the opening, an oscillating lifter pivoted substantially in the plane of the table and adapted to lift one end of the rest of the pile from the bottom sheet thereof, substantially as described.

3. The combination of the vacuum-box 6, having an inclined sheet-supporting wall provided with the opening 7^a, the oscillating lifter 11, provided with an angular lip, a carrier provided with a gripper, and means adapted to operate the lifter and the gripper in suitable time with each other, substantially as described.

WILLIAM A. LORENZ.

Witnesses:

W. H. HONISS,
A. MUTTER.