

W. F. MINNICK.

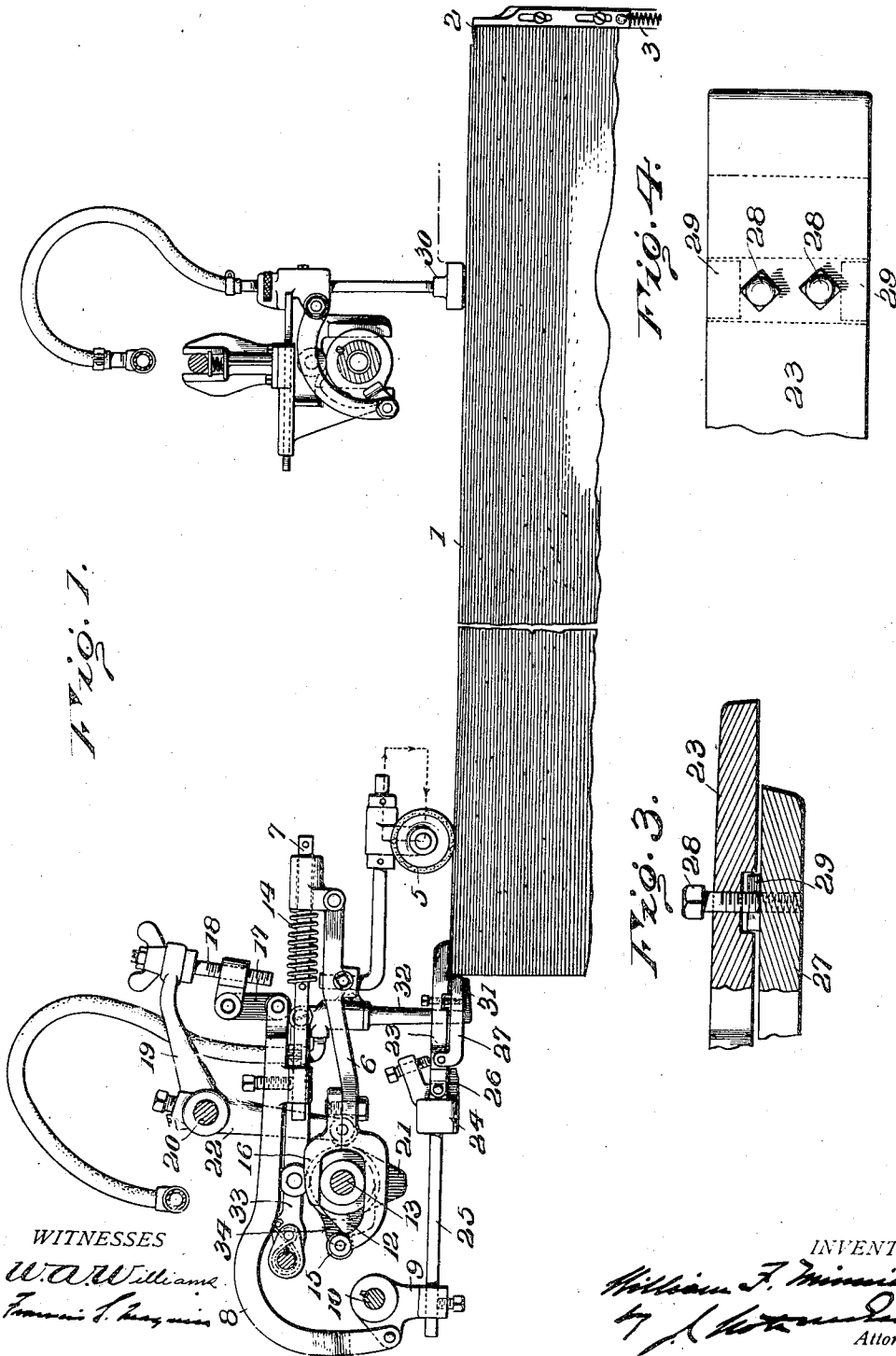
SHEET FEEDER.

APPLICATION FILED DEC. 19, 1912.

1,123,348.

Patented Jan. 5, 1915.

2 SHEETS—SHEET 1.



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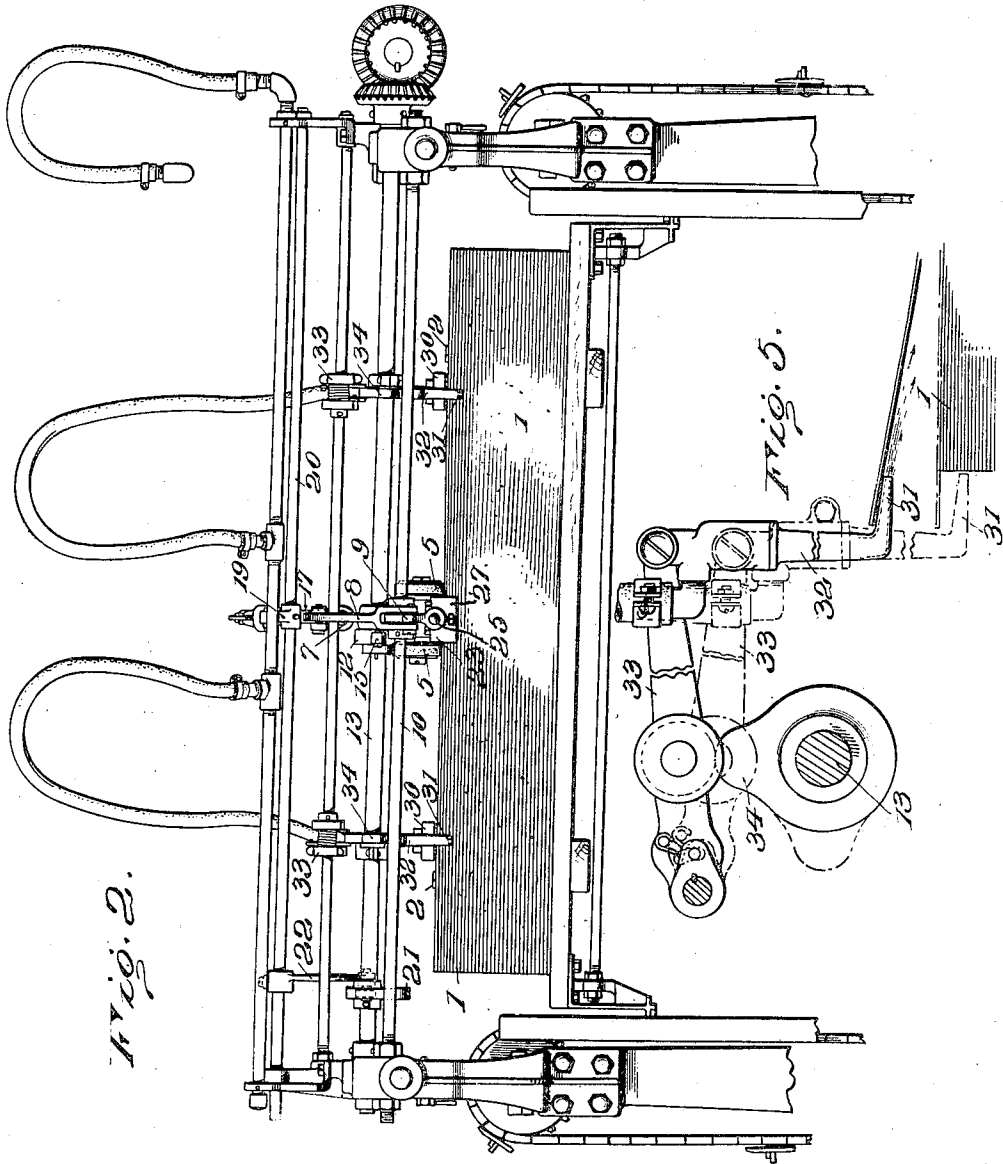
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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SHEET-FEEDER.

1,123,348.

Specification of Letters Patent.

Patented Jan. 5, 1915.

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To all whom it may concern:

Be it known that I, WILLIAM F. MINNICK, of Niles, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Sheet-Feeders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In feeding sheets of paste-board or other relatively heavy elements from a pile or stack thereof, heretofore difficulty has been experienced in separating the topmost sheet from the pile, the friction which is required to move the top sheet usually also affecting the next succeeding sheet or sheets, thereby displacing the top of the pile to such an extent as to seriously interfere with the accomplishment of good results.

The primary object of my invention is to overcome these difficulties, and this I do by means which will preclude more than one sheet being displaced in each operation of the feeder, only the topmost element of the pile being bodily moved by the feeder in each operation thereof.

In the accompanying drawings, Figure 1 is a side elevation with parts omitted. Fig. 2 is an end view. Fig. 3 is an enlarged longitudinal sectional view of the caliper. Fig. 4 is a plan view thereof. Fig. 5 shows a blower.

Referring to the drawings, 1 designates a pile of stock, supposedly paste-board or other heavy material for the handling of which my invention is especially designed, since according to known means the handling of relatively thin material is easily accomplished, but heretofore the separation of heavy material has been attended with more or less difficulty and usually has been impossible. The pile may be supported by any suitable means capable of maintaining its top at substantially a uniform level. The front edge of the top of the pile is engaged by the overhanging hooked end 2 of a retainer which is shown attached to an upright 3 against which the pile bears. In practice, several retainers are preferably employed. It is necessary to withdraw the front edge of the topmost sheet from beneath the hook or hooks 2 before such sheet can be carried forward to the feeding rolls of the printing or other machine.

While the means employed for separating the sheets, that is, for moving them rearwardly sufficiently far to clear their front ends of the retaining hooks, may be widely varied, I have found that a friction separator such as is shown at 5 will answer all requirements. It is shown in the form of rubbers or non-rotating rollers whose carrier 6 is slidable back and forth on a rod 7 supported by an arm 8 pivoted to a bracket 9 secured on a cross-rod 10 of the feeder frame, such carrier being positively operated in one direction—rearwardly—by a cam 12 on a constantly-rotating shaft 13, and returned to its former—forward—position by the recoil of a spring 14 which is compressed when the carrier is moved rearwardly. The carrier has a roller 15 with which the cam engages, and an overhanging guide 16 which extends above the cam shaft. The supporting arm 8 is adjustably suspended by a link 17 from a screw 18 mounted in an arm 19 of a rock shaft 20 by which the friction separator and its carrier are raised from the pile when being moved forward by the spring and lowered when the cam is drawing the parts rearwardly. The rock shaft derives its motion from a cam 21 on shaft 13 acting on the roller of an arm 22 part to said shaft.

For the purpose of preventing more than one piece of stock being withdrawn from beneath the retaining hooks by the action of the friction separator, I provide means which will prevent the bodily displacement of any of the pile elements save the topmost, and a calipering device which is always in line with the top of the pile to receive the topmost element thereof. The construction of the device may be widely varied. It is shown in the form of a plate 23 pivoted at its rear end to a head 24 on the end of a rod 25 adjustably held to bracket 9, said head having a shoulder 26 which limits the downward movement of the device. To the underside of this plate is pivoted the rear end of a jaw or second plate 27, the upper surface of which is designed to practically parallel the undersurface of the upper jaw or plate, the intervening space being sufficient to receive but one piece of stock at a time. The size or width of this space may be changed to suit the width or thickness of the stock being handled. For this purpose I have shown the two jaws or plates connected by

screws 28. The lower plate is preferably provided with top lugs 29 on its upper surface to limit the entrance of the stock, the underside of the upper plate being formed with a recess to accommodate said lugs. The latter also serve to register the stock and may be extended laterally any desired distance.

In practice, when the friction separator is drawn rearwardly by the cam, the friction on the pile will have the tendency to affect several of the sheets at the top thereof, but the bodily displacement of such sheets will be resisted by the substantially vertical front or forward end of the jaw or plate 27, which plate is thickened for that purpose, but the topmost sheet or element being free of resistance will, however, enter the calipering space, its movement being arrested only upon engagement with stops 29. Thus the top sheet alone will be withdrawn from beneath the overhanging retaining hooks, and may be removed from the pile without interfering with any of the remaining sheets. I have shown suction lifters 30 which are capable of being lowered into engagement with the top of the pile for lifting one sheet at a time and carrying it forward to the feeding rolls.

As a sheet is moved rearward into the opening of the calipering device its rear edge is brought immediately above the forwardly projecting foot 31 of a blower 32 which latter is thereupon raised on a straight line, and as it lifts the rear edge of the topmost sheet from the pile a blast of air is ejected beneath the sheet in the direction of travel, thus insuring separation. I preferably use two such lifting blowers, and they are designed to raise the edges of the sheets while the latter are in engagement with the calipering device. Any means may be employed for raising and lowering them on a vertical plane substantially parallel with the rear of the pile. I have shown one of these blowers (see Fig. 5) carried by an arm 33 which is raised by a cam 34. When lowered the forwardly projecting feet lie just back of the top of the pile at the rear thereof.

Although I have shown and described a very simple form of embodiment of my invention, yet it must be understood that the latter is not confined to such construction, or to any specific combination or arrangement of parts, and hence changes may be made in the means employed without departing from the spirit of my invention.

I claim as my invention:

1. In a feeder for sheets of cardboard and other heavy material, a calipering device having a space corresponding in width to the thickness of a single sheet, means for moving the top sheet from a pile of sheets into such space, registering means with

which the sheet is designed to engage, and means for moving such sheet in the opposite direction.

2. In a feeder for sheets of cardboard and other heavy material, a calipering device having a space corresponding in width to the thickness of a single sheet, means for adjusting the width of said space, means for moving the top sheet from a pile of sheets into such space, registering means with which the sheet is designed to engage, and means for moving such sheet in the opposite direction.

3. In a sheet feeder, means for engaging the top of a pile of stock for moving it bodily in one direction, means with which the pile engages for allowing the bodily displacement of only the topmost element of the pile, means for removing such topmost element after it has been displaced bodily relatively to the pile, and an upwardly movable member for engaging the underside of such element.

4. In a sheet feeder, means for engaging the top of a pile of stock to move it bodily in one direction, a calipering device having a substantially vertical flat face with which the edge of the pile engages, said device having a space at approximately right angles to said face to receive the topmost element of the pile, means for removing such element after it has been moved into such space, and a blower for ejecting air below said topmost element.

5. In a sheet feeder, means for engaging the top of a pile of stock for moving it bodily in one direction, means with which the pile engages for allowing the bodily displacement of only the topmost element of the pile, means for removing such topmost element after it has been displaced relatively to the pile, and an upwardly movable blower for engaging the underside of such element and ejecting air thereunder.

6. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, means for engaging the top of the pile to remove or withdraw the topmost element thereof from beneath the overhanging member, a calipering device having a substantially vertical flat face with which the edge of the pile engages, said device having a space at approximately right angles to said face corresponding in width to the thickness of a single element to receive the topmost element of the pile, and means for removing said element after it has been withdrawn from said retaining member.

7. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, means for engaging the top of the pile to remove or withdraw the topmost element thereof from beneath the overhanging member, a device with which the rear edge of the pile is designed to engage

having a space in line with and designed to receive only the topmost element of the pile, means for removing such element after it has been withdrawn from beneath such retaining member, and an upwardly movable member for engaging the underside of such element.

8. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, means for engaging the top of the pile to remove or withdraw the topmost element thereof from beneath the overhanging member, a device with which the rear edge of the pile is designed to engage having a space in line with and designed to receive only the topmost element of the pile, means for removing such element after it has been withdrawn from beneath such retaining member, and a blower for ejecting air beneath such topmost element.

9. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, means for engaging the top of the pile to remove or withdraw the topmost element thereof from beneath the overhanging member, a device with which the rear edge of the pile is designed to engage having a space in line with and designed to receive only the topmost element of the pile, means for removing such element after it has been withdrawn from beneath such retaining member, and an upwardly movable blower for engaging the underside of such element and ejecting air thereunder.

10. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, a reciprocating device for

acting on the pile to withdraw the topmost element thereof from beneath said retaining member, a device resting loosely on the pile and extending down over the rear edge thereof for resisting the action of said reciprocating device save as to the topmost element of the pile, said device having a space in line with and designed to receive said topmost element, and also having registering means with which the sheets engage, means for regulating the width of such space, and means for withdrawing the topmost element from said device and moving it in opposite direction to its initial movement.

11. In a sheet feeder, a retaining member designed to overhang the forward edge of a pile of stock, a reciprocating device for acting on the pile to withdraw the topmost element thereof from beneath said retaining member, a device resting loosely on the pile and extending down over the rear edge thereof for resisting the action of said reciprocating device save as to the topmost element of the pile, said device having a space in line with and designed to receive said topmost element, and a registering member with which the topmost element is designed to engage when in such space.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILLIAM F. MINNICK.

Witnesses:

WALTER H. SMITH,
GEO. D. PARRY.