

W. WOMERSLEY.
PAPER FEEDING MACHINE.

No. 481,992.

Patented Sept. 6, 1892.

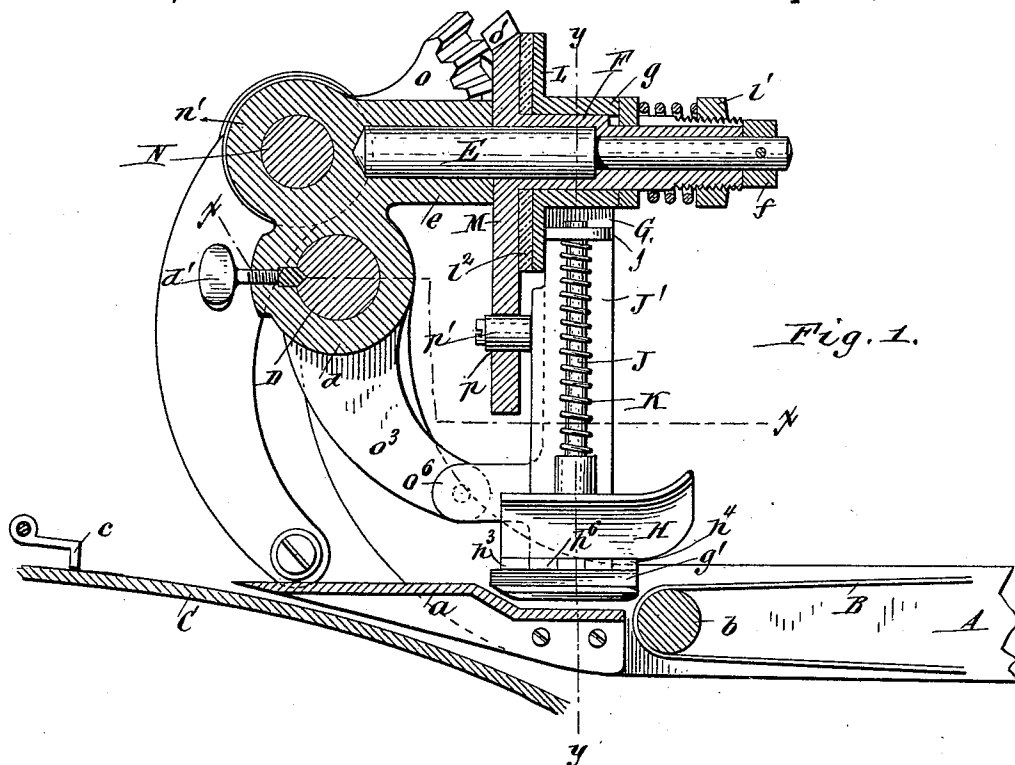
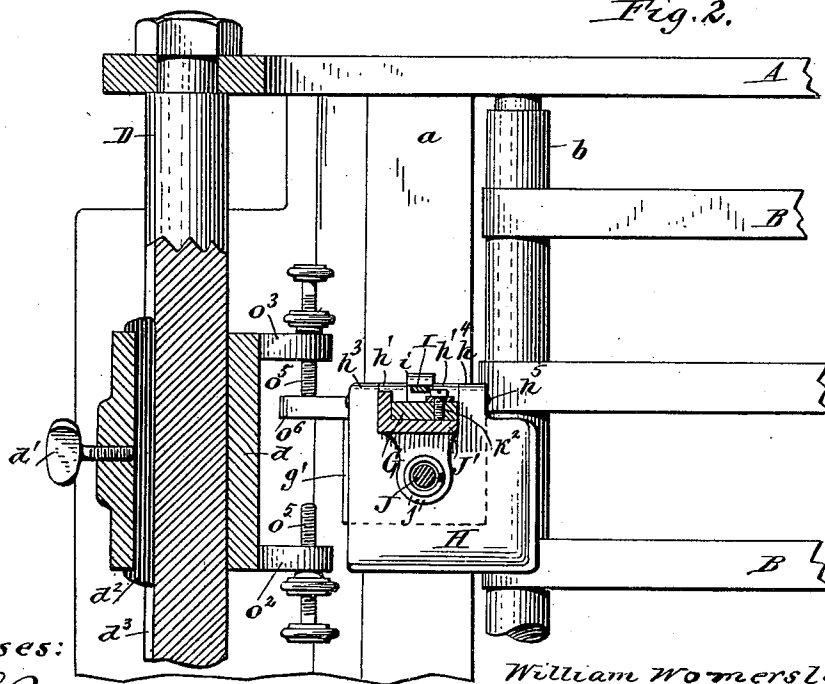


Fig. 2.



Witnesses:

Theo. L. Popp.

John St. Arduer.

William Womersley,

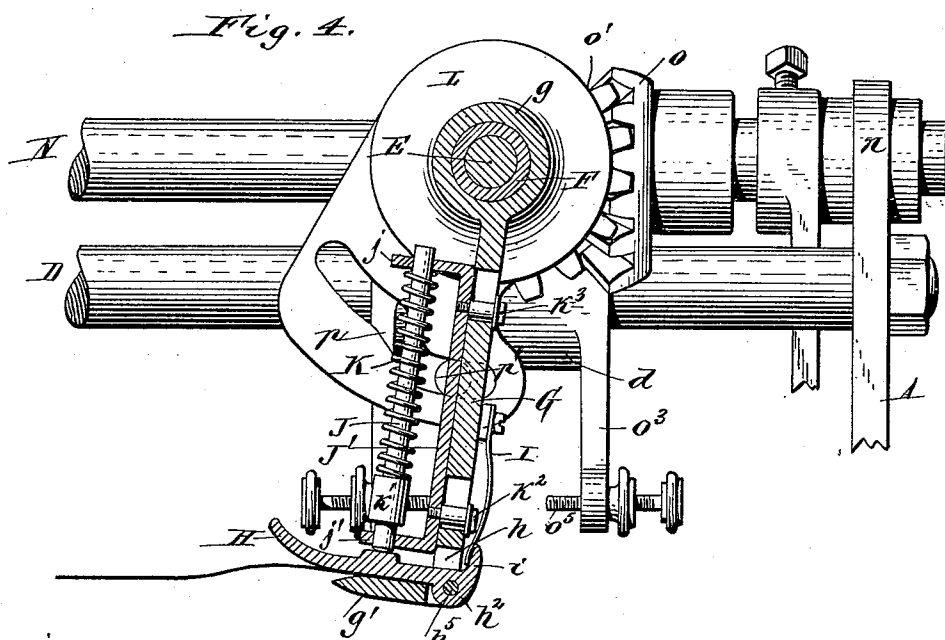
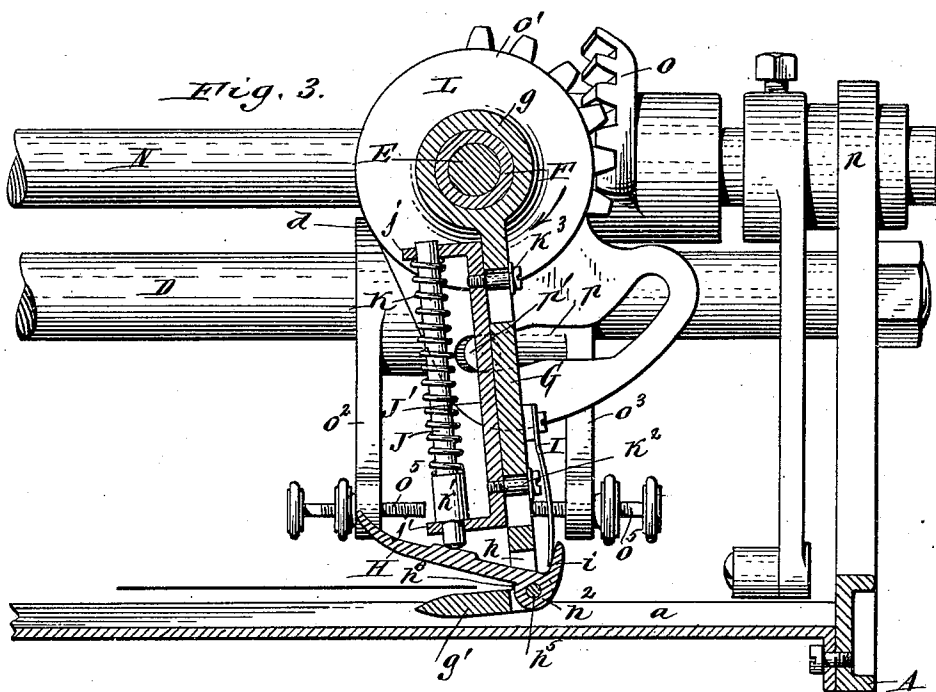
Inventor.

By Wilhelm Bonner Attorneys.

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Theo. L. Papp
John N. Arduer.

William Womersley, Inventor.
By Wilhelm Bonner,
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM WOMERSLEY, OF POUGHKEEPSIE, ASSIGNOR TO D. H. BURRELL & CO., OF LITTLE FALLS, NEW YORK.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,992, dated September 6, 1892.

Application filed August 20, 1891. Serial No. 403,174. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WOMERSLEY, a citizen of the United States, residing at Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and useful Improvement in Paper-Feeding Machines, of which the following is a specification.

This invention relates to a side-registering gripper whereby sheets of paper fed by an automatic paper-feeder are correctly registered before entering the printing-press, ruling, or other machine to which the sheets are fed. When the edge of a very thin sheet of paper strikes against an abrupt surface on a gripper, the edge of the sheet is liable to buckle or curl during the forward movement of the gripper in a direction at right angles to the sheet, and when the gripper-jaws are closed upon the marginal portion of the sheet when in this buckled or curled condition the sheet is creased or wrinkled, and thereby prevented from being correctly registered.

The object of my invention is to so construct and operate the jaws of the gripper that the edge of the sheet of paper lying between the jaws is prevented from buckling or curling.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal sectional elevation of my improved side-registering mechanism, showing the same applied to the delivery-tape mechanism of a paper-feeder. Fig. 2 is a horizontal section thereof in line *x x*, Fig. 1. Fig. 3 is a vertical transverse section in line *y y*, Fig. 1, showing the gripper in its normal retracted position. Fig. 4 is a similar view showing the gripper moved inwardly and gripping the sheet.

Like letters of reference refer to like parts in the several figures.

A represents the side frames supporting the tape mechanism, and *a* represents a transverse feed-board connecting the rear portions of the side frames, only one of the latter being shown in the drawings.

B represents the sheet-delivery tapes, which are arranged lengthwise and pass with their delivery portions around a delivering-roller *b*, arranged near the front end of the feed-board.

C represents the cylinder of a printing-press, provided with the usual drop-guides *c*, against which the front edge of the sheet is fed by the delivery-tapes.

D represents a supporting-rod arranged transversely over the feed-board and secured with its ends to the upturned ends of the side frames.

d represents a transversely-movable sleeve which supports the side-registering gripper and its actuating mechanism. This sleeve is mounted upon the supporting-rod and is capable of lengthwise adjustment thereon. A clamping-screw *d'* is arranged in the sleeve and adapted to bear against a key *d²*, arranged in a longitudinal groove *d³* in the supporting-rod, so as to hold the sleeve in position after adjustment.

E represents a horizontal arbor, which carries the gripper by which the side of the sheet is registered and its actuating mechanism. This arbor is arranged lengthwise over the feed-board and is rigidly secured with its rear end to a boss *e*, formed on the front side of the supporting-sleeve.

F represents a carrier-sleeve surrounding the arbor and arranged between the boss of the supporting-sleeve and a collar *f*, secured to the front end of the arbor.

G represents a depending gripper-arm provided at its upper end with an eye *g*, which is hung loosely on the carrier-sleeve surrounding the arbor. The gripper-arm is provided at its lower end with a fixed gripper-jaw *g'*, arranged at right angles, or nearly so, to the arm and extending inwardly.

H represents the upper jaw of the gripper, which is capable of moving toward and from the lower jaw and which clamps the sheet of paper between said jaws. The lower portion of the gripper-arm adjoining the lower jaw is provided with a central opening *h* and two outwardly-projecting ears *h'*, arranged on opposite sides of said opening. The upper gripper-jaw is provided on its outer side with three perforated ears *h² h³ h⁴*. The central ear *h²* extends through the opening *h* in the gripper-arm and is arranged between the ears *h'* of the latter, while the ears *h³ h⁴* are arranged against the outer sides of the ears *h'* of the gripper-arm.

7⁵ represents a hinge-pin passing through the ears of the gripper-arm and of the upper movable jaw, whereby the upper jaw is hinged upon the gripper-arm. The pivot of the upper jaw is so arranged that the gripper-jaws converge outwardly when in an open position, as represented in Fig. 3. The upright inner face *h*⁶ of the gripper-arm adjacent to the lower gripper-jaw forms the registering-guide against which the lateral edge of the sheet rests in moving the gripper inwardly.

I represents a flat spring whereby the upper jaw is yieldingly held in an open position. This spring is secured with its upper end to the rear side of the gripper-arm and bears with its lower end against the inner side of an upwardly-projecting nose *i*, formed on the central ear of the upper jaw, thereby tending to hold the latter open.

J represents an upright presser-rod bearing with its lower end against the upper side of the upper jaw.

J' represents a vertically-movable plate provided with perforated ears *j, j'* at its upper and lower ends and in which the presser-rod is guided.

K represents a tension-spring surrounding the presser-rod and bearing with its lower end against a collar *k'*, formed on the lower portion of the presser-rod, while its upper end bears against the upper ear *j* of the supporting-plate, thereby yieldingly holding the presser-rod in a depressed position. The supporting-plate is movably secured to the gripper-arm by guide-screws *k*² *k*³, arranged in longitudinal guide-slots formed in the gripper-arm.

L represents a friction-disk formed at the rearend of the eye of the gripper-arm and bearing against a cam-plate *M*, formed at the rear end of the carrier-sleeve. The friction-disk is firmly held in contact with the cam-plate by a spring *l*, surrounding the carrier-sleeve and bearing with its ends against the eye of the rock-arm, and a screw-nut *l'*, arranged on the screw-threaded front end of the carrier-sleeve. A washer *l*² of leather is preferably interposed between the cam-plate and friction-disk to increase the friction.

N represents a rock-shaft whereby an oscillating movement is imparted to the cam-plate and the gripper-arm frictionally connected therewith. The rock-shaft is journaled with its ends in bearings *n*, formed in the side frames and journaled with its intermediate portion in a bearing *n'*, formed on the upper side of the supporting-sleeve.

O represents a bevel-gear segment mounted on the rock-shaft and meshing with a similar gear-segment *o'*, formed on the upper portion of the cam-plate, whereby the latter and the gripper frictionally connected therewith are oscillated. An intermittent rocking motion is imparted to the rock-shaft from any suitable moving part of the machine, to which it is attached.

*o*² *o*³ represent stop-arms whereby the oscillating movement of the gripper is limited.

These arms are formed on the lower side of the supporting-sleeve and extend forward across the inner and outer side of the gripper-arm. Each of the stop-arms is provided with an adjusting-screw *o*⁵, against which an ear *o*⁶ on the gripper-arm strikes. The cam-plate extends below the friction-disk and is provided with a cam-slot *p*, which receives a roller or pin *p'*, secured to the rear side of the supporting-plate of the presser-rod.

In delivering the sheet from the tapes against the front drop-guides of the printing-press the lateral edge of the sheet passes between the two jaws of the gripper, the entrance between them being facilitated by the flaring form of the receiving portions of the jaws, as shown in the drawings. After the sheet has been fed squarely against the front drop-guides the rock-shaft and gear-segments rotate the cam-plate in the direction of the arrow, Fig. 3. The cam-plate, owing to its frictional connection with the gripper-arm, carries the gripper forward with it, and in so doing the registering-guide *h*⁶ of the gripper strikes the lateral edge of the sheet and buckles the latter slightly beyond the jaws of the gripper. By hinging the outer side of the upper jaw closely to the outer side of the lower jaw the jaws converge, with their opposite surfaces toward the registering-face *h*⁶. This causes the jaws in moving forward to guide the edge of the sheet toward the narrowest portion of the space between the jaws and causes the edge of the sheet to strike the registering-face of the grippers squarely. This prevents the edge of the sheet from curling or buckling between the jaws, which would cause the sheet to be creased and wrinkled by the subsequent closing of the jaws and which would render it impossible to correctly register the sheet. The cam-plate and the gripper move forward in unison until the gripper-arm strikes the inner stop-screw *o*⁵. The latter arrests the inward movement of the gripper, but the cam-plate continues in its course. As the cam-plate continues its inward movement its cam-slot *p* forces the pin *p'* and the supporting-plate of the upper jaw downwardly until the upper jaw of the gripper bears firmly on the sheet resting on the lower jaw. The upper jaw and the presser-rod now cease their downward movement, but the supporting-plate still continues to move downwardly, which causes the tension-spring surrounding the presser-rod to be compressed, thereby increasing the pressure of the presser-rod and upper jaw upon the sheet. When the cam-plate has reached the limit of its forward movement, its cam-slot, engaging with the pin of the supporting-plate, holds the gripper in its closed position. The reverse movement of the rock-shaft now carries the cam-plate and the gripper holding the sheet backward in unison until the gripper-arm strikes the outer stop-screw *o*⁵. This arrests the farther outward movement of the

gripper, but the cam-plate continues to move outwardly, thereby causing its cam-slot to raise the supporting-plate and presser-rod from the upper gripper-jaw, which permits the latter to be opened by the spring I, thereby releasing the sheet of paper from the gripper and leaving the same in correct side register. The next instant the front drop-guides are raised and the nippers of the printing-press carry away the sheet in correct front and side register.

I claim as my invention—

1. The combination, with a rock-arm provided with a lower fixed jaw, of an upper movable jaw hinged to the rock-arm, an oscillating cam, a spring-rod and support movably mounted on the rock-arm and actuated by the cam to close the movable jaw, and means whereby the movable jaw is opened, substantially as set forth.

2. The combination, with a rock-arm provided with a fixed jaw and a movable jaw hinged to the rock-arm, of a spring attached to the rock-arm and holding the movable jaw open, an oscillating cam, and intermediate mechanism whereby the movable jaw is closed by the cam, substantially as set forth.

3. The combination, with the movable gripper-arm and the fixed jaw secured to the lower end of said arm, of a movable jaw pivoted to the gripper-arm and having a movement toward and from the fixed jaw, a nose formed on the movable jaw, a spring secured to the gripper-arm and bearing against the nose of the movable jaw, whereby the latter is yield-

ingly held in an open position, an oscillating cam, and intermediate mechanism whereby the movable jaw is closed by the cam, substantially as set forth.

4. The combination, with the movable gripper-arm and the fixed jaw secured to the lower end of said arm, of a movable jaw pivoted to the gripper-arm, a spring whereby said movable jaw is opened, a presser-rod bearing loosely upon said movable jaw, a plate movably arranged upon said gripper-arm, and a spring whereby a yielding connection is formed between the presser-rod and the supporting-plate, substantially as set forth.

5. The combination, with the movable gripper-arm provided at its lower end with a fixed jaw, of a movable jaw pivoted to said arm and provided with a nose on its upper side, a spring secured to the gripper-arm and bearing against said nose, an upright rod resting loosely upon said movable jaw and provided with a collar, a movable plate arranged upon the gripper-arm and provided with an ear supporting said rod, a spring surrounding said rod and bearing with its ends against said collar and ear, and a cam whereby the movable plate is actuated, substantially as set forth.

Witness my hand this 8th day of August, 1891.

WILLIAM WOMERSLEY.

Witnesses:

J. S. VAN CLEEF,
WILLIAM J. KENNEDY.