

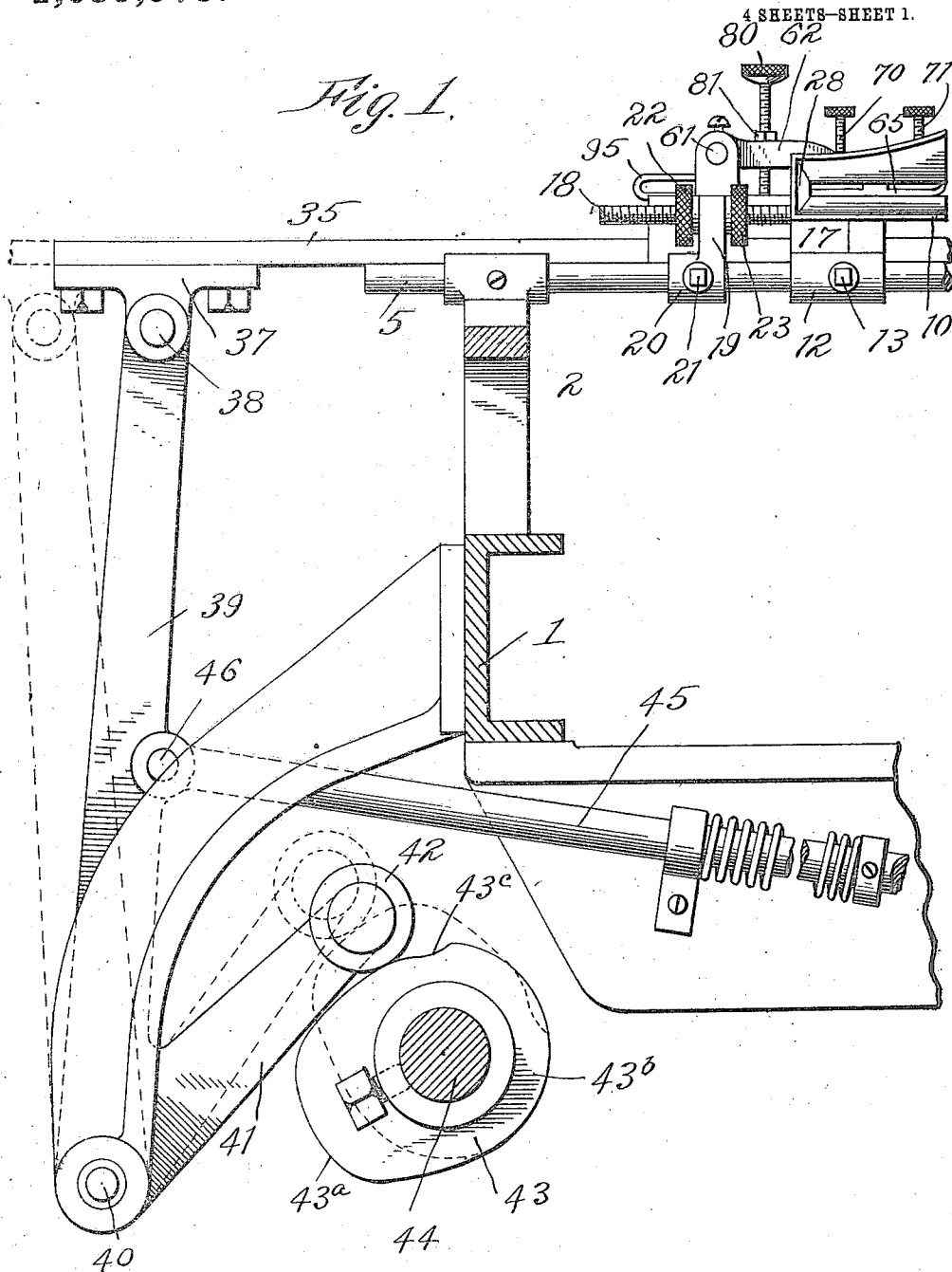
C. O. L. CARDELL.
SHEET REGISTERING GRIPPER MECHANISM.
APPLICATION FILED FEB. 1, 1912.

1,059,975.

Patented Apr. 29, 1913.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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Ray J. Ernst.

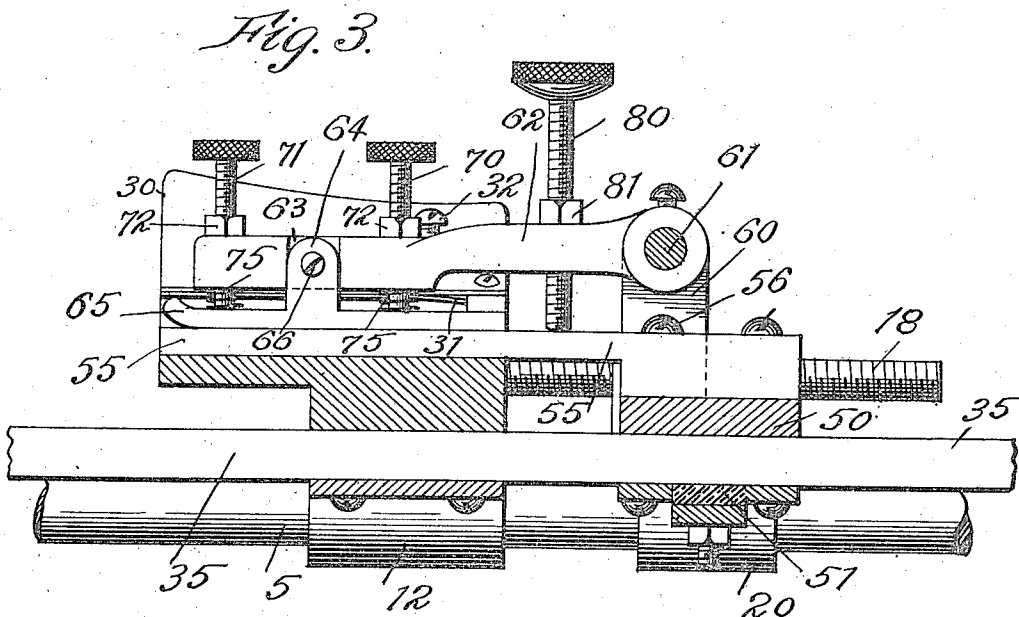
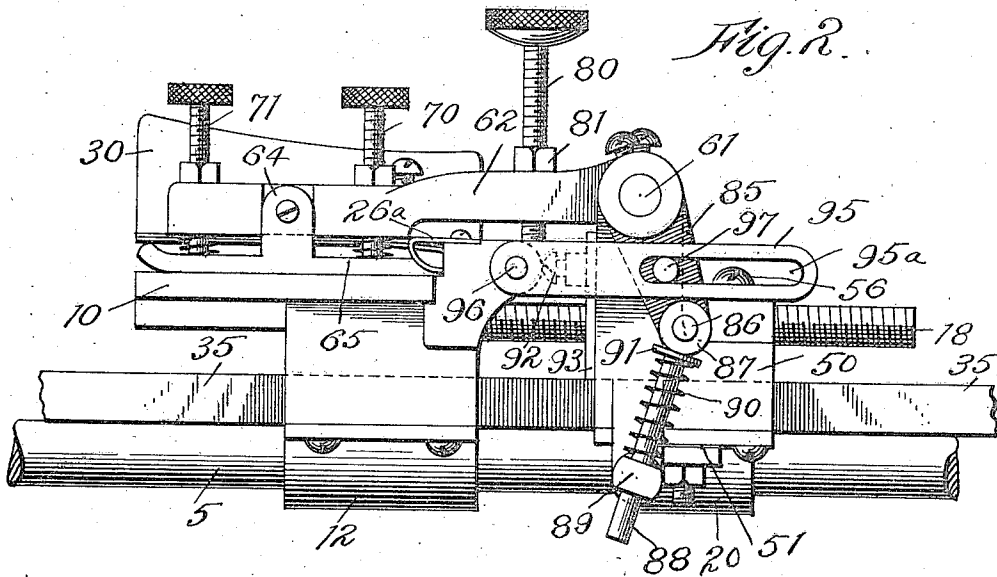
Charles O. L. Cardell Inventor,
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4 SHEETS—SHEET 2.



Witnesses:
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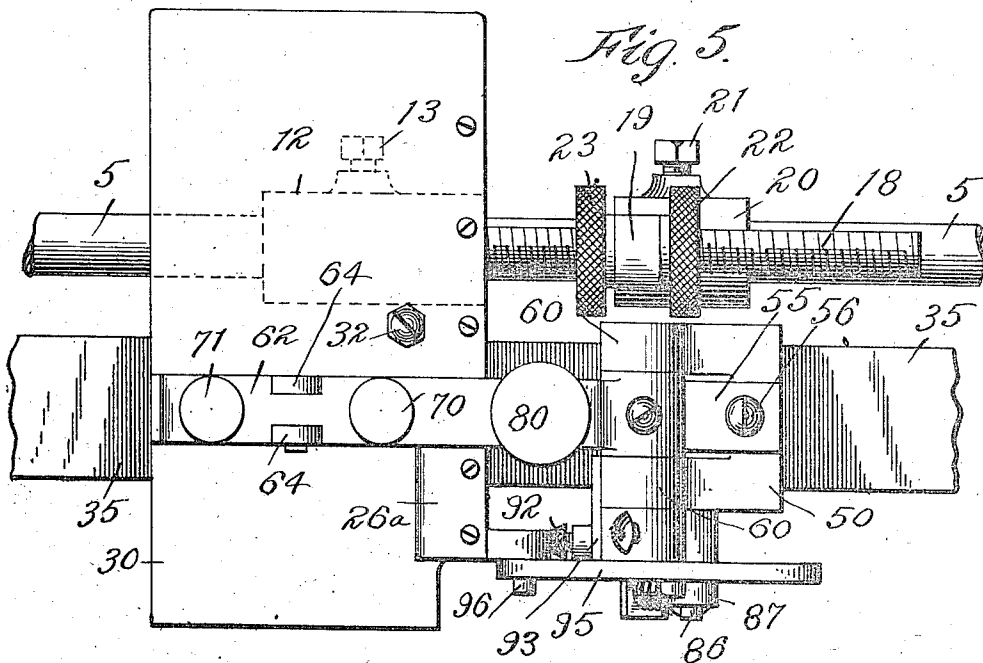
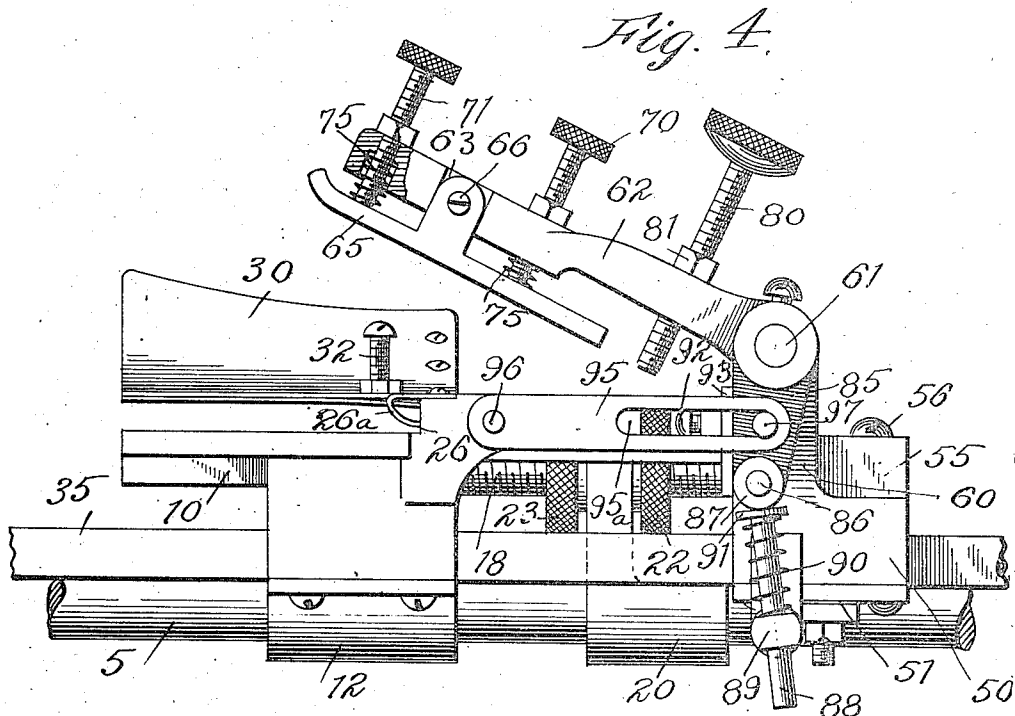
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4 SHEETS—SHEET 3.

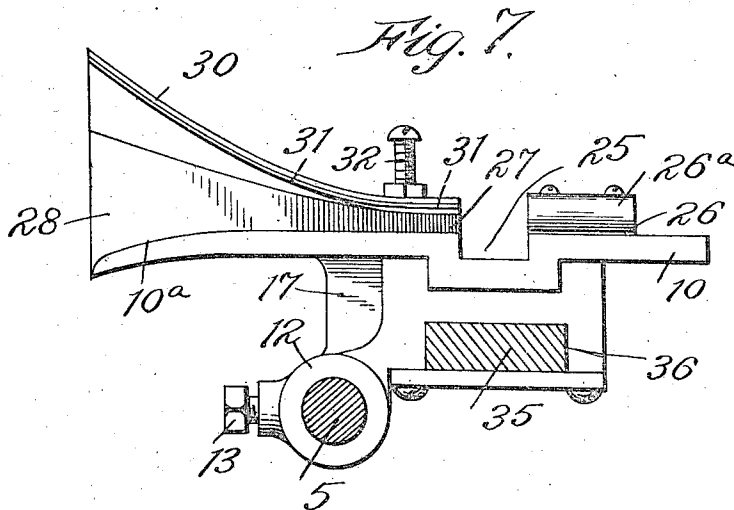
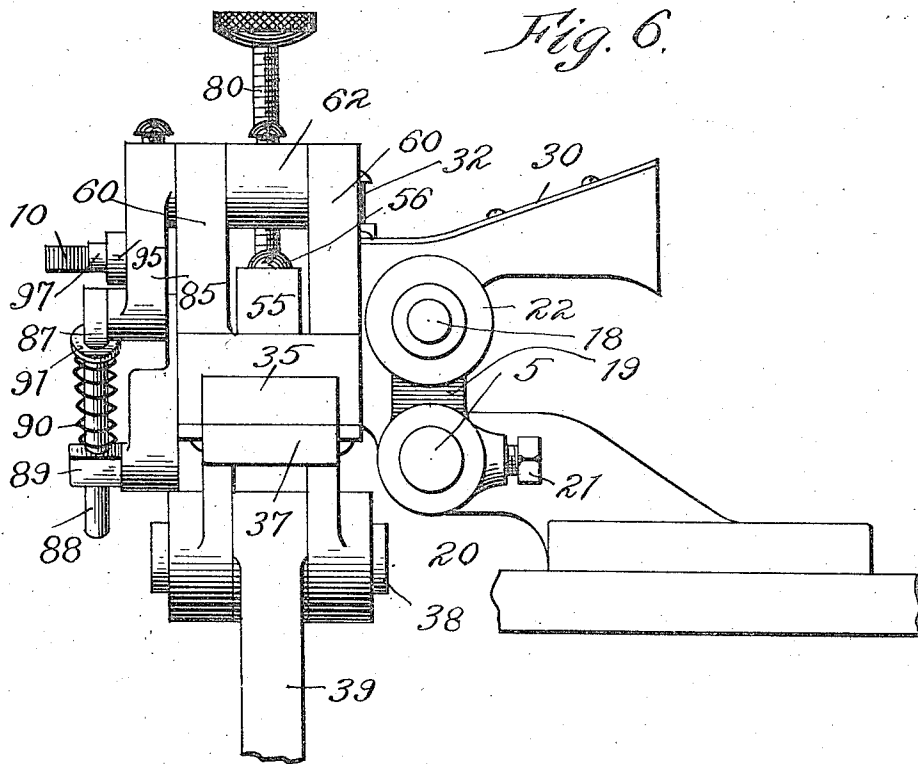


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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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SHEET-REGISTERING GRIPPER MECHANISM.

1,059,975.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed February 1, 1912. Serial No. 674,774.

To all whom it may concern:

Be it known that I, CHARLES O. L. CARDELL, a citizen of the United States, and a resident of Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Sheet-Registering Gripper Mechanism, of which the following is a full and clear specification.

10 The present invention relates to improvements in the type of sheet registering grippers having a lower gripper member mounted beneath the plane of feed of sheets and an upper gripper member mounted above the plane of feed of sheets and movable toward and away from the lower member. The two gripper members in this type of mechanism are mounted upon a carriage which has imparted to it an intermittent to and fro motion for carrying the gripper inwardly to grasp a sheet and outwardly to move the gripped sheet against a registering gage. Such registering grippers are variously used in paper handling machinery, they being frequently applied, for instance, as side registering grippers upon sheet conveyers, or as side registering grippers in paper folding machinery.

20 The purpose of the present invention is to improve the structure of this type of sheet registering gripper mechanism and to this end I have provided the upper movable gripper member with an adjustable gripper shoe which can be accurately set at any desired angle upon its supporting arm to present it in proper parallel relation to the under gripper member. With this adjustable shoe it is possible to present the gripping surfaces of the two members in parallel relation no matter what the thickness of the stock being operated upon.

30 Another feature of the improved registering gripper is the provision for limiting the closing action of the gripper by means of an adjustable stop with the result that the closed relation of the gripper members can be determined so as to grip the stock with only sufficient power to register the sheet, thus avoiding the marring of the stock by exerting unnecessary pressure. This feature is important when acting upon thick soft paper.

40 In all registering gripper mechanisms of the type referred to known to me, the operation of the gripper has been so timed

that the sheet is passed into position for the action of the side registering mechanism while the side registering gripper is in withdrawn position with the result that the groove in the base plate for the reception of the lower gripper member is entirely open and frequently engages the leading edge of an incoming sheet and interferes with the proper entry of the sheet into the machine. One feature of the present invention is the arrangement of the operating mechanism of the registering gripper so that the gripper will be in its inner position with its jaws open when the sheet passes into position for registry. With the gripper in this position, the groove in the base plate which supports the lower gripper member is completely closed so that there is no shoulder or ledge presented to interfere with the free inward movement of the leading edge of the incoming sheet. This operation of the gripper removes a very serious objection to this type of mechanism.

60 The improved gripper mechanism includes gripper members which are relatively long parallel with their direction of movement in registering sheets with the result that the range of action of the registering gripper is extended. A further feature of the improved mechanism is the provision of a flaring guide yoke with an adjustable guide wall which can be moved toward or away from the opposite guide wall of the yoke to confine the sheets more or less at the point of registry depending upon the quality and thickness of the paper and its rumpled condition.

70 In order that my invention may be fully understood I will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

80 In said drawings Figure 1 is a vertical transverse sectional elevation of a part of a paper folding machine showing my improved registering gripper applied thereto, the gripper being closed in the act of registering a sheet. Fig. 2 is a detail side elevation of the gripper mechanism looking from the side opposite to that shown in Fig. 1. Fig. 3 is a longitudinal sectional view of the same. Fig. 4 is a view similar to Fig. 2, showing the gripper in open position. Fig. 5 is a plan view of the gripper. Fig. 6 is an end elevation of the same. Fig. 7 is a detail 110

side elevation of the flaring guide yoke and gripper support or carriage.

As above stated the type of side registering gripper mechanism to which my present invention relates may be employed in various forms of paper handling machinery. For the purpose of illustration I have shown it applied to the frame of a paper folding machine.

1 represents a part of the frame of a folding machine having upright brackets one of which is shown at 2, supporting in their upper socketed ends an adjustable stay bar 5 upon which the improved sheet registering mechanism is mounted.

10 is a sheet supporting and registering plate formed integral with or otherwise rigidly secured to a sleeve 12 which is adjustably mounted upon the stay bar 5 and secured in the desired adjusted position thereon by means of a set screw 13. This plate 10 is supported in the plane of feed of sheets at one side of the path thereof. A lug 17 formed integral with the plate 10 and sleeve 12, has rigidly secured to it a laterally projecting threaded bolt 18 which passes freely through an opening in a guide lug 19 formed integral with and projecting up from a sleeve 20 embracing the stay bar 5 and adjustably secured thereon by a set screw 21. Threaded upon the bolt 18 upon opposite sides of the bearing lug 19 are the milled nuts 22 and 23. By loosening the set screw 13 so that the socket 12 can slide upon bar 5, the sheet registering plate 10 can be adjusted inwardly and outwardly transversely of the plane of feed of sheets to present the side gage (hereinafter referred to) in the proper registering plane to impart the desired registry to the sheets. This adjustment of the plate 10 is accomplished by operating the milled nuts 22 and 23.

The plate 10 is formed with a shallow transverse recess or groove 25 in its upper face to receive the lower gripper member of the registering gripper presently explained. Upon opposite sides of the recess 25 are formed vertical side gages or registering faces 26 and 27 which may be upon lugs or flanges cast integral with the base plate 10, or, if preferred, may be separate adjustable parts. The registering wall 27 flares outwardly at its receiving end as shown at 28 so as to avoid possible interference with the incoming sheets.

The incoming end of base plate 10 is also curved or flared downwardly as shown at 10^a for the same purpose. A flared and curved top plate or guide 30 is presented above the receiving end of the plate 10 with its flared end opposite the flared portions 28 and 10^a above referred to so as to present a flaring opening which gradually contracts toward the transverse groove 25. This top guide plate 30 is formed with a double wall the

inner portion 31 of which is separated from the upper portion 30 at its inner corner adjacent to registry face 27 and an adjusting screw 32 is threaded through the top wall 30 into engagement with the separated corner of inner plate 31 so that the inner plate can be adjusted toward and away from the surface of plate 10 to confine the sheet more or less at this point, depending upon the condition and thickness of the stock.

Secured to the registry face or lug 26 is an inwardly presented spring finger 26^a for properly guiding the registry edge of the sheet against gage face 26 when the sheet is drawn laterally by the action of the registering mechanism.

35 is a transversely extending reciprocatory bar mounted to operate in the squared bearing socket 36 formed in the casting beneath the plate 10. Additional bearings may be provided for this bar if desired. The outer end of this reciprocatory bar 35 has secured to it a lug 37 to which is pivoted at 38 the upper end of a rocking lever 39 journaled at 40 and formed with an integral laterally extending arm 41 carrying an anti-friction roller 42 operating upon the periphery of a controlling cam 43 secured to a cam shaft 44 which is driven in any suitable manner. This cam 43 has an extreme high portion 43^a, an intermediate portion 43^b and a short low or depressed portion 43^c for the purpose hereinafter explained. A spring actuated rod 45 is connected with the rock arm 39 at 46 to cause the rock arm 41 to follow the contour of the operating cam 43 and cause the intermittent reciprocation of the bar 35 as hereinafter explained.

A yoke 50 is adjustably mounted upon the bar 35 and normally held against displacement thereon by means of an adjustable friction block 51 secured to the yoke and engaging the lower surface of the bar 35.

55 is the lower gripper member in the form of a narrow blade or tongue which is rigidly secured at its rear end to yoke 50 by means of set screws 56. This lower gripper member or tongue 55 projects from the yoke 50 into the shallow groove or recess 25 of base plate 10 and is adapted to reciprocate in said groove. The upper surface of the member 55 is flush with the upper surface of the plate 10.

The yoke 50 is formed with two upwardly projecting bracket arms 60 in the upper ends of which is freely journaled a short rock shaft 61 having rigidly secured to it between the bracket arms 60 the inwardly presented gripper arm 62. This gripper arm 62 is provided adjacent to its inner end with the vertical recesses 63 in its opposite sides in which rest the upwardly presented ears or lugs 64 of the gripper shoe 65, a pivot pin or screw passing through the ears or lugs 64 and

gripper arm 62 for pivotally mounting the shoe 65 upon the gripper arm. Adjusting screws 70 and 71 provided with lock nuts 72 are threaded vertically through the gripper arm 62 upon opposite sides of the pivot 66 and engage the upper surface of the gripper shoe 65 upon opposite sides of its pivot. Small expansion springs 75 are seated in recesses in the underface of gripper arm 62 around the adjusting screws 70 and 71 and in engagement with the upper surface of the gripper shoe 65.

80 is a long adjusting screw provided with a lock nut 81 threaded through the gripper arm 62 adjacent to rock shaft 61 in position to engage the upper face of lower gripper member or tongue 55. Said screw forms an adjustable stop for limiting the closing action of the upper gripper member.

The rock shaft 61 has secured to it at one end a depending rock arm 85 carrying at its lower end a laterally projecting pin 86 pivoted in the eye 87 formed upon the upper end of rod 88 which passes freely through a swiveled guide lug 89 mounted upon a projection of the yoke 50. An expansion spring 90 surrounds rod 88 and is confined between the swivel lug 89 at one end and a washer 91 upon rod 88 upon the other end. The rock arm 85 and spring actuated rod 88 constitute a toggle lock for holding the upper gripper member in either raised or lowered position. The downward movement of the upper gripper member is limited by its engagement with the lower member or tongue 55 while the upward movement is limited by an adjustable stop screw 92 threaded through a bracket plate 93 secured to the rear face of one of the bracket arms 60, said screw being presented in the path of rock arm 85 as the gripper arm moves upwardly.

95 is a longitudinally slotted link pivotally mounted at 96 to a bracket projecting from base plate 10. A pin 97 projects laterally from rock arm 85 and works in the slot 95^a of the link 95. At the inner and outer limits of movement of the gripper mechanism the pin 97 engages the ends of slot 95^a for causing the closing and opening of the gripper.

The operation of the mechanism will be plain from the following description: When the parts are properly adjusted it will be understood that the sheets are passed into the machine equipped with the improved registering mechanism, in the direction transverse to the gripper. As each sheet passes into position to be registered the gripper is presented in opened position at almost the limit of its inward movement, the anti-friction roller 42 of the operating mechanism being at this moment upon the intermediate portion 43^b of the operating

cam. When the sheet comes to rest at the end gages, the registering gripper is given its final inward movement by reason of anti-friction roller 42 dropping into the depression 43^c of the operating cam. This final inward movement causes pin 97 to engage inner end of slot 95^a, to close the upper gripper member upon the sheet. Immediately after the closing of the gripper the anti-friction roller 42 travels upon the extreme high portion 43^a of the cam which moves outwardly the bar 35 to take the gripper and the gripped sheet laterally until the side edge of the sheet engages the registering faces 26 and 27. When the sheet engages the side registering faces the gripper members will slide upon the sheet. At the extreme outward motion of the gripper mechanism the pin 97 engages the outer end of slot 95^a of link 95 and raises the movable gripper member away from the lower member, thereby releasing the sheet so that it can be taken by the mechanism arranged to operate upon it. Immediately after the opening of the gripper at its outward movement, the cam 43 moves the gripper inwardly again and retains it at its inner intermediate position with the gripper open while the registered sheet is being passed into position for registry. This feature of having the gripper at its inner intermediate position while a new sheet is passing into position is of importance in this type of mechanism for the reason that the groove in the sheet supporting plate 10 is closed by the presence of the lower gripper member or tongue 55, so that there is no obstructing corner or ledge to engage the leading edge of the incoming sheet as has been the case with this type of mechanism as previously employed.

By reason of the provision of the adjustable gripper shoe and the means for limiting the closing action of the gripper, I am able to adjust the gripper action to suit the particular character of the stock being operated upon, thus reducing to a minimum the marring action of the gripper upon the stock.

What I claim is:

1. In a mechanism of the character described, the combination of a registering gage, a reciprocatory bar, a sheet gripper member carried by said bar, a fixed post, and a link pivotally mounted upon said post and having a lost motion operative connection with said gripper.

2. In a mechanism of the character described, the combination of a bracket having a sheet registering gage, a reciprocatory bar operating adjacent to said bracket, a lower gripper member carried by said bar, a gripper arm pivotally mounted upon said bar, a gripper shoe adjustably mounted upon said gripper arm in operative relation

to said lower gripper member, and an adjustable limit screw threaded through said gripper arm and adapted to engage the lower gripper member for limiting the closing action of said gripper.

3. In a mechanism of the character described, the combination of a flaring guide yoke adapted to be supported at one side of the path of sheets and including a sheet supporting and registering plate presented in the plane of movement of sheets, and an overhanging double guide wall for confining sheets with relation to said plate, an adjusting screw threaded through the outer portion of said double wall and engaging the inner portion of said double wall for adjusting the latter toward and away from said plate, a registering gage at one side of said plate, and a sheet registering gripper operating adjacent to said plate.

4. In a mechanism of the character described, the combination of a sheet registering gage, a reciprocatory bar operating adjacent said gage, a lower gripper member carried by said bar, a gripper arm pivotally mounted upon said bar, and an adjustable limit screw threaded through said gripper arm and adapted to engage the lower gripper member for limiting the closing action of said gripper.

5. In a mechanism of the character described, the combination of a registering gage, a reciprocatory bar, a sheet gripper member carried by said bar, a gripper arm journaled upon said bar, and a link pivotally mounted on a fixed pivot and having lost motion connection with said gripper arm.

6. In a mechanism of the character described, the combination of a bracket, a registering gage upon said bracket, a reciprocatory bar mounted adjacent to said bracket, a sheet registering blade, or under gripper member carried by said bar and supported beneath the plane of feed of sheets, a gripper arm journaled upon said

bar, a friction shoe mounted upon said gripper arm and supported thereby above said registering plate, a post projecting from said bracket, and a link pivotally mounted upon said post and having pin and slot connection with said gripper arm.

7. In a mechanism of the character described, the combination of a sheet supporting and registering plate, formed with a bearing socket, a registering gage upon said plate, a bar reciprocably mounted in said socket, a sheet engaging blade mounted upon said bar and supported flush with said supporting and registering plate, a bracket projecting up from said bar, a rocking lever pivotally mounted in said bracket, a gripper shoe adjustably mounted upon said lever and supported thereby above said sheet engaging blade, and means for operating said lever.

8. In a mechanism of the character described, the combination of a sheet supporting and registering plate, a registering gage upon said plate, a reciprocatory bar mounted beneath said plate and extending transversely thereof, means for reciprocating said bar, a sheet engaging blade mounted upon said bar and supported flush with said supporting and registering plate, a bracket projecting up from said bar, a lever pivotally mounted in said bracket said lever being provided with a rock arm, a friction shoe mounted upon said lever and supported thereby above said sheet engaging blade, a spring device engaging said rock arm for yieldingly retaining it in either of its positions, a stud mounted in said rock arm, a post projecting up from said plate, a stud upon said post, and a longitudinally slotted link pivotally mounted upon one of said studs and engaged in its slot by the other of said studs.

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