F. W. NEELY.

SHEET GROUPING MACHINE.

APPLICATION FILED DEC. 13, 1919. RENEWED MAR. 18, 1922.

1,432,890. Patented Oct. 24, 1922.

3 SHEETS—SHEET 1.

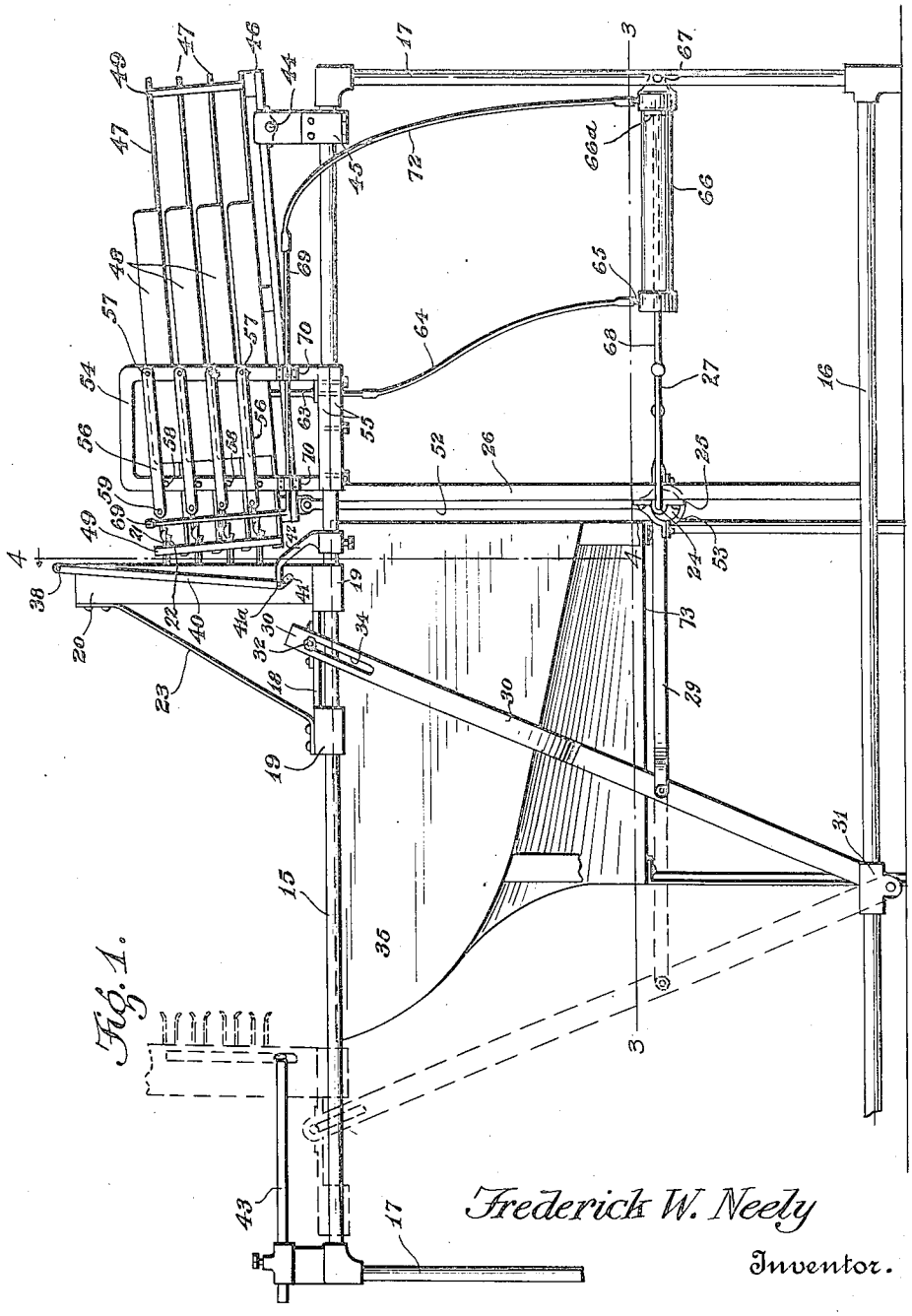


Fig. 1.

Frederick W. Neely

Inventor.

By Wilbur P. Thomas & Co.

Attorneys.

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3 SHEETS—SHEET 2.

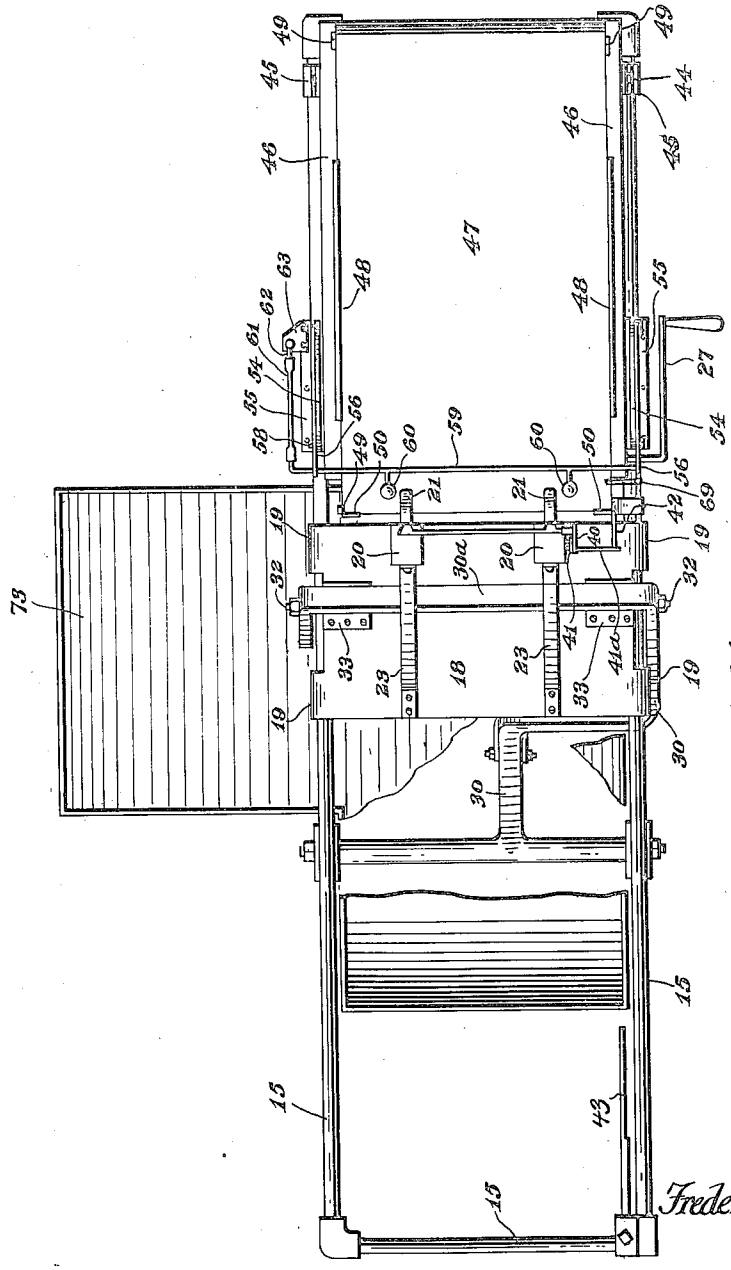


Fig. 2.

Frederick W. Neely

Inventor.

By Miller & Thomas Co.

Attorneys.

F. W. NEELY.

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3 SHEETS—SHEET 3.

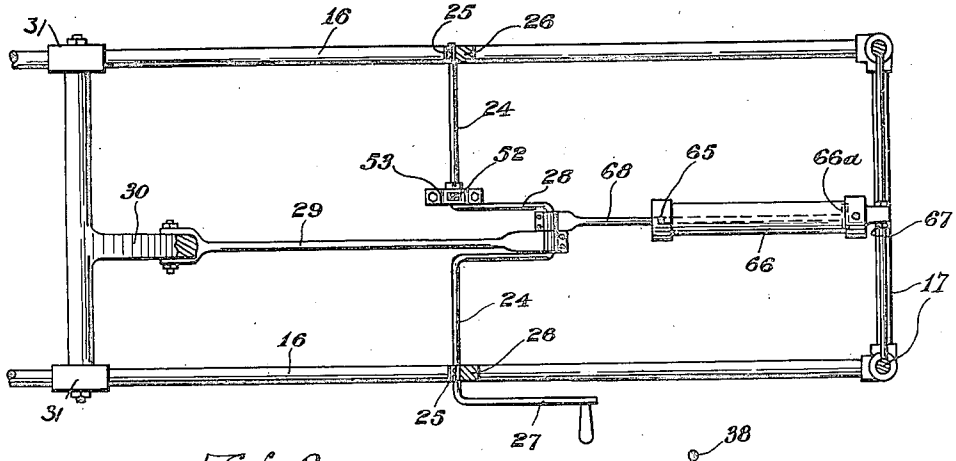


Fig. 3.

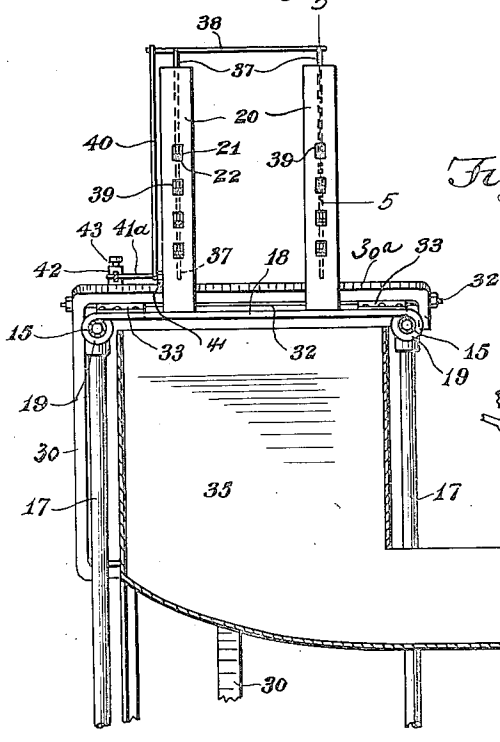


Fig. 4.

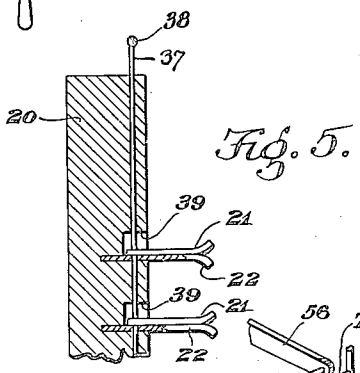


Fig. 5.

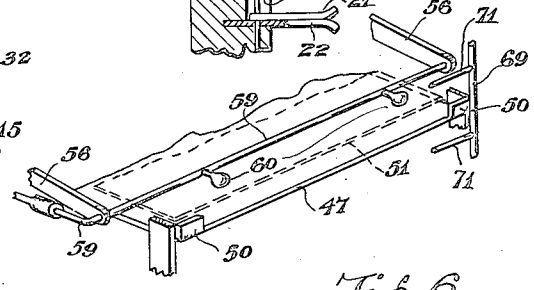


Fig. 6.

Frederick W. Neely

INVENTOR.

BY Wilson Thomas & Co.

ATTORNEYS.

Patented Oct. 24, 1922. 1,432,890

UNITED STATES PATENT OFFICE.

FREDERICK W. NEELY, OF CHICAGO, ILLINOIS.

SHEET-GROUPING MACHINE.

Application filed December 13, 1919, Serial No. 344,577. Renewed March 18, 1922. Serial No. 544,977.

To all whom it may concern:

Be it known that I, FREDERICK W. NEELY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Sheet-Grouping Machines, of which the following is a specification.

This invention is a machine for assembling sheets of different characters into groups, and thereafter placing such assembled sheets in a single pile. The machine is designed primarily, although not limited thereto, for assembling typewriter paper, carbon sheets and copy sheets in their regular order, ready for use. The several sheets, grouped in this manner, are placed in a single pile from which the operator of the typewriter obtains his or her supply of letter heads or other sheets, carbon sheets and copy sheets arranged in proper order ready for the machine. Any number of carbon and copy sheets may be assembled with a letter sheet, according to the number of carbon copies desired.

In order that the invention may be better understood, reference is had to the accompanying drawings forming a part of this specification, and in said drawings,

Figure 1 is a side elevation of the machine;

Figure 2 is a plan view thereof;

Figures 3 and 4 are sections on the line 3—3 and 4—4, respectively, of Figure 1;

Figure 5 is an enlarged section on the line 5—5 of Figure 4, and

Figure 6 is a detail in perspective.

Referring specifically to the drawings, the frame of the machine is made of light metal tubing, and comprises top sections 15, bottom sections 16 and ends 17. On the top of the frame is mounted a carriage composed of a platform 18 having bearings 19 which are slidably mounted on the side rails of the frame top. The carriage is therefore supported for a horizontal reciprocatory motion. From platform 18 rise laterally spaced uprights 20 carrying sheet gripping jaws 21 and 22, respectively, and provided with braces 23.

The carriage is reciprocated by the following mechanism:

Some distance below the top of the supporting frame are bearings 25 which support a transverse shaft 24. The bearings are on uprights 26 fitted in the supporting frame. The shaft 24 has a crank-handle 27; or it may be power driven, and its crank 28 is connected by a pitman 29 to a lever 30 having a fulcrum support 31 at the bottom of the supporting frame. The platform 18 has a cross rod 32 held thereto by plates 33, and the ends of said cross rod seat in slots 34 in the lever 30. It will be noted that the lever 30 has a lateral offset to come alongside the carriage platform 18 at one side, and it also has a top lateral bend 30^a across the carriage to the opposite side thereof, where it has a downward bend for connection with the rod 32 on this side of the carriage. This arrangement of the lever provides an operating connection at each side of the carriage, so that it will slide freely and without binding, and at the same time the lever is clear of the sheet receptacle 35 to be presently described.

The sheet gripping units carried by the uprights 20 are composed of jaws 21 and 22, there being a plurality of pairs of jaws on each upright, according to the number of sheets to be gripped. The drawings show four units on each upright, and the units on the respective uprights are in horizontal alignment so that each sheet is engageable by two grippers. The jaws 21 and 22 are resilient strips, the latter being stationary and embedded or otherwise securely fastened in the uprights 20, whereas the former have a vertical movement toward and from the latter. In the uprights are mounted vertically slidable rods 37 connected at the top by a cross rod 38. The jaws 21 are made fast to these rods and hence they are actuated together. The uprights have pockets 39 for access to the jaw members.

On the outside of one of the uprights 20, the cross rod 38 is fitted with a lifter bar 40 linked by a small crank 41 to the upright, and having an outstanding abutment in the form of a pin 41^a. On the side bar of the frame top 15 are adjustably positioned trip members 42 and 43, which are longitudinally spaced. When the abutment 41^a strikes the trip member 42, the bar 40 is operated to carry the slidable jaw support-

ing rod 37 downwardly, thereby closing the jaws 21 toward the jaws 22, and when the abutment strikes the trip member 43, the parts move in the opposite direction to open the jaws.

At that end of the supporting frame of the machine toward which the jaws 21 and 22 point is mounted a support for the supply of sheets to be assembled and piled. This support comprises superposed shelves 47, four of such, corresponding to the number of gripper units, being provided. It will be understood, however, that the number of gripper units and shelves may be varied according to the number and different kinds of sheets to be operated on.

The top frame members 15 carry brackets 45 supporting a cross rod 44, by which a base board 46 is pivotally supported. This base board supports the shelves 47, the latter having high upstanding guard flanges 48 at their side edges, reinforcing side strips 49, and front guards or stops 50 for the sheets. Figure 6 shows dotted at 51 one of the sheets on a shelf.

The assembly of sheet supporting shelves 47 carried by the pivoted base 46 is adapted to be swung to raise and lower its forward end (the end from which the sheets are taken), this operation being effected by the rod 52 of an eccentric 53 on the shaft 24.

On each side of the shelf assembly is a frame 54 with a suitably secured base 55. On this frame are pivoted arms 56, as shown at 57, said arms resting on stop pins 58. The free end of each pair of arms 56 carries a tube 59 extending transversely of the shelves 47 at their forward ends which are opposite the jaw members 21 and 22. From each tube project two suction nozzles 60 which are cup-shaped and open downwardly. The ends of the tube 59 are connected by a flexible hose 61 to nipples 62 of a manifold 63 from which a flexible hose 64 leads to one end of an air pump cylinder 66 pivoted to the supporting frame at 67. The plunger 65^a working in the cylinder 66 is operated by a rod 68 from the crank 28.

On one side of the shelves 47, at the forward ends thereof, is a vertical pipe 69 secured at 70 to the frame of the machine and having small discharge nozzles 71 directed to discharge transversely of the shelves against the edges of the sheets thereon. The pipe 79 obtains a supply of air from the opposite end of the pump cylinder 66 by a hose 72.

The operation of the machine may be summarized as follows:

The sheets to be assembled will be placed on the shelves 47, there being a pile of different kinds of sheets on each shelf. One pile may be letter heads, another pile carbon paper, and another pile copy sheets, and so forth. The shaft 24 being in motion, the platform 18 carrying the sheet gripper units is slid back and forth between the trip devices 42 and 43. The shelves 47 are also rocked up and down, and the air pump is in operation, so that during its in-stroke suction is produced at the nozzles 60 and air is blown from the nozzles 71. The operation of the parts is so timed that when the gripper jaws 21 and 22 are near the limit of their travel toward the shelves 47, they are open, and the nozzles 60 have sucked up the top sheets on the respective shelves, and the latter have also dropped, leaving said sheets suspended from the suction nozzles. Air is also blown from the nozzles 71 against the edges of the sheets, so that if any other sheets should be adhering to the elevated sheets, they will be blown off and drop back on the stacks on the shelves. The nozzles 60 are so positioned relative to the gripper jaws that the latter engage the elevated sheet. At the end of the travel of the carriage toward the shelves, the pin 41^a strikes the abutment 42, whereupon the jaws close on the sheets therebetween, and the carriage then moves forwardly toward the receptacle 35. At the same time, the suction at the nozzles 60 is broken, so that the sheets are released and carried forward as the gripper unit moves forwardly, and at the end of its forward movement, the pin 41^a strikes the abutment 43, whereupon the jaws open and allow the sheets to drop into the receptacle 35. The bottom of this receptacle is curved to direct the falling sets of assembled sheets to one side, and said bottom also has a lateral slant toward a delivery section 73 of the receptacle. The gripper unit now moves back toward the shelves 47, which in the meantime have been elevated, and the hereinbefore described operation is repeated.

While the action of the air in the nozzles 60 and 71 will be reversed on the return or out-stroke of the pump, it will be obvious that this change will have no harmful effect on the piled or outgoing sheets.

The arms 56 are pivotally supported to adapt the part carried thereby to the variable height of the stacks of sheets on the shelves 47. Thus, if the stacks are high as first deposited on the shelves, the rising of the latter will, shortly after the start, cause the top of the stack to strike the suction nozzles 60, and the continued ascent of the stacks will lift the nozzles and their supporting arms 56 the additional distance. This distance will be decreased gradually as the sheets are drawn off the stacks, one at a time, as hereinbefore described.

The preferred embodiment of the invention has been shown, but it will be understood that various changes and modifications

may be made without a departure from the spirit and scope of the invention as claimed hereinafter.

I claim—

1. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

2. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, means for elevating the top sheets from the remainder, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

3. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, suction means for elevating the top sheets from the remainder, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

4. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, suction means for elevating the top sheets from the remainder, means for discharging an air blast against the edges of the elevated sheets, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

5. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, means for elevating the top sheets from the remainder, means for discharging an air blast against the edges of the elevated sheets, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

6. A sheet grouping mechanism comprising a plurality of sheet supports, a sheet receiver, a slidable carriage movable toward and from said support and the sheet receiver, gripper members on the carriage and positioned to engage the top sheets on the supports, suction nozzles located above the sheet supports for elevating the top sheets, pivoted supports for said nozzles, means for opening the gripper members to engage said sheets and thereafter closing the same, and means for opening the gripper members when the carriage has moved to the sheet receiver.

7. A sheet grouping mechanism comprising a plurality of pivoted sheet supports, a sheet receiver, suction means for elevating the top sheets from the remainder, means for lowering the sheet supports when the suction means are operating, to leave elevated the sheets held by said means, a sheet receiver, a slidable carriage movable between the sheet supports and the receiver, gripper members on the carriage, means for opening the gripper members to engage the elevated sheets and thereafter closing the same, and means for opening the gripper members when the carriage reaches the receiver.

8. A sheet grouping mechanism comprising a plurality of pivoted sheet supports, a sheet receiver, suction means for elevating the top sheets from the remainder, pivoted supports for the suction means, means for lowering the sheet supports when the suction means are operating, to leave elevated the sheets held by said means, a sheet receiver, a slidable carriage movable between the sheet supports and the receiver, gripper members on the carriage, means opening the gripper members to engage the elevated sheets and thereafter closing the same, and means for opening the gripper members when the carriage reaches the receiver.

9. A sheet grouping mechanism comprising a plurality of pivoted sheet supports, a sheet receiver, suction means for elevating the top sheets from the remainder, means for lowering the sheet supports when the suction means are operating, to leave elevated the sheets held by said means, means for discharging an air blast against the edges of the elevated sheets, a sheet receiver, a slidable carriage movable between the sheet supports and the receiver, gripper members on the carriage, means for opening the gripper members to engage the elevated sheets and thereafter closing the same, and means for opening the gripper members when the carriage reaches the receiver.

10. A sheet grouping mechanism compris-

ing a plurality of pivoted sheet supports, a sheet receiver, suction means for elevating the top sheets from the remainder, pivoted supports for the suction means, means for lowering the sheet supports when the suction means are operating, to leave elevated the sheets held by said means, means for discharging an air blast against the edges of the elevated sheets, a sheet receiver, a slidable carriage movable between the sheet supports and the receiver, gripper members on the carriage, means for opening the gripper members to engage the elevated sheets and thereafter closing the same, and means for opening the gripper members when the carriage reaches the receiver.

In testimony whereof I affix my signature.

FREDERICK W. NEELY.