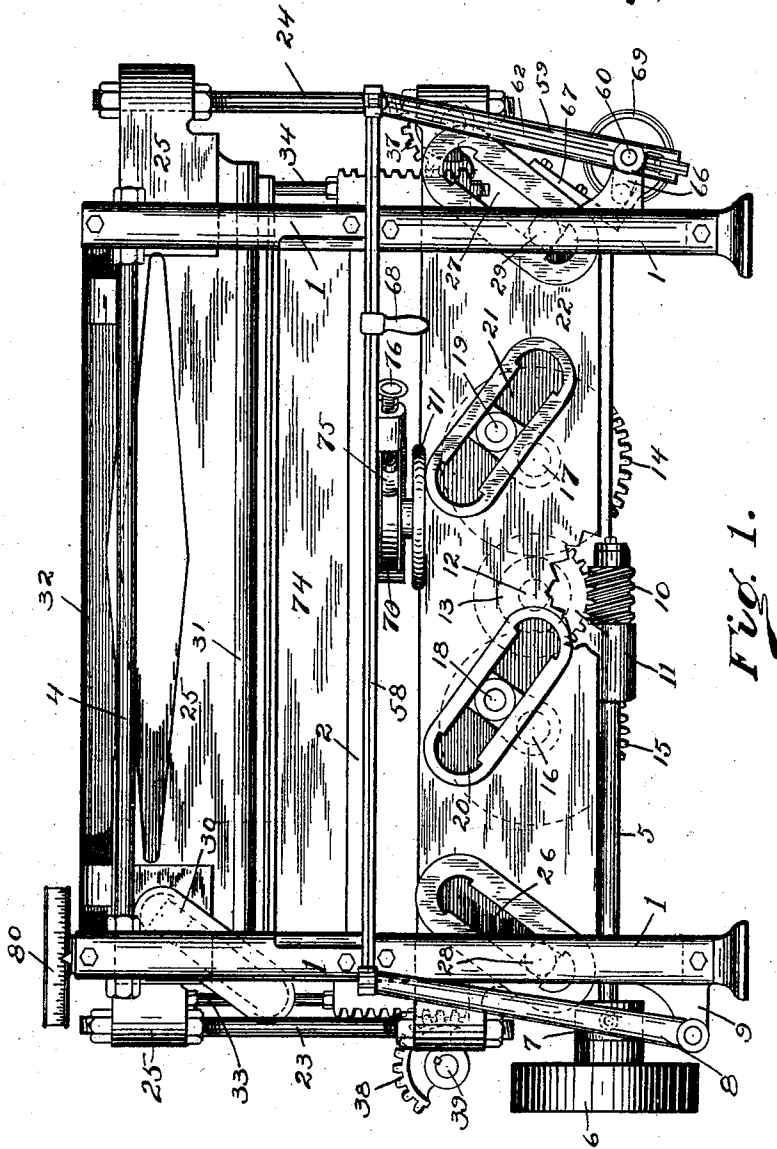


C. SEYBOLD.
PAPER CUTTING MACHINE.
APPLICATION FILED JUNE 27, 1906.

918,205.

Patented Apr. 13, 1909.
3 SHEETS—SHEET 1.



Witnesses
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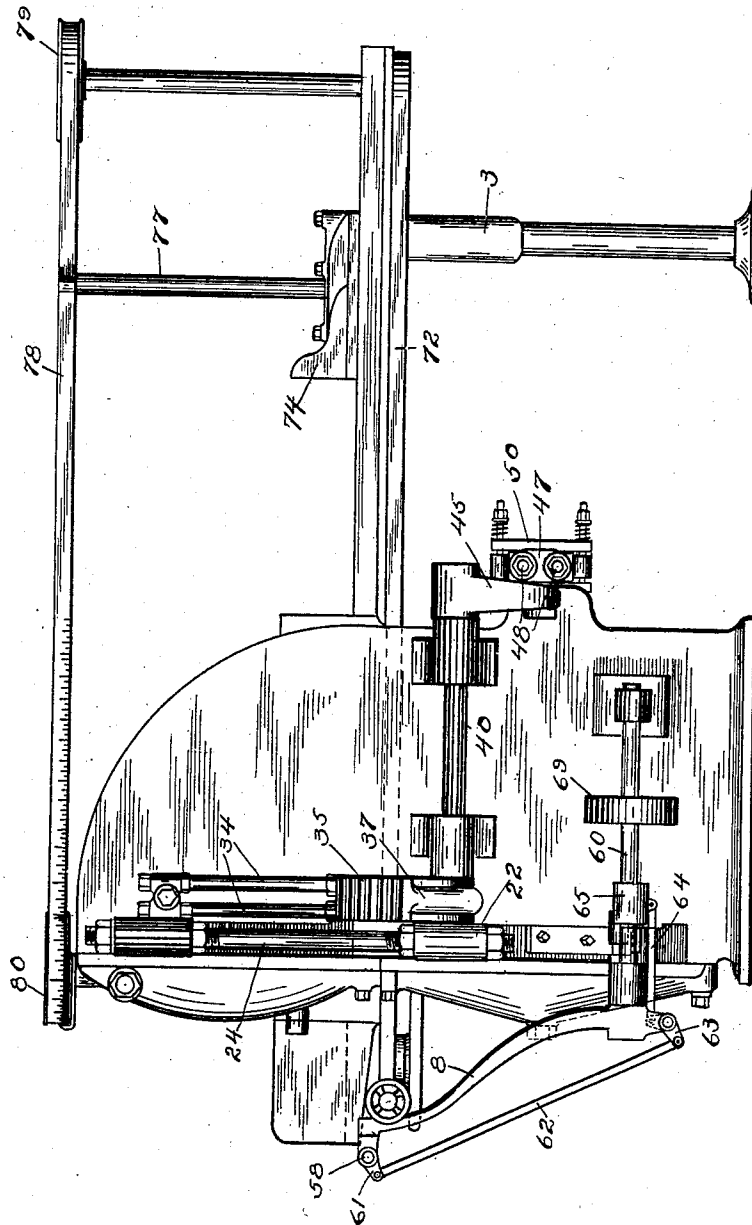


Fig. 2.

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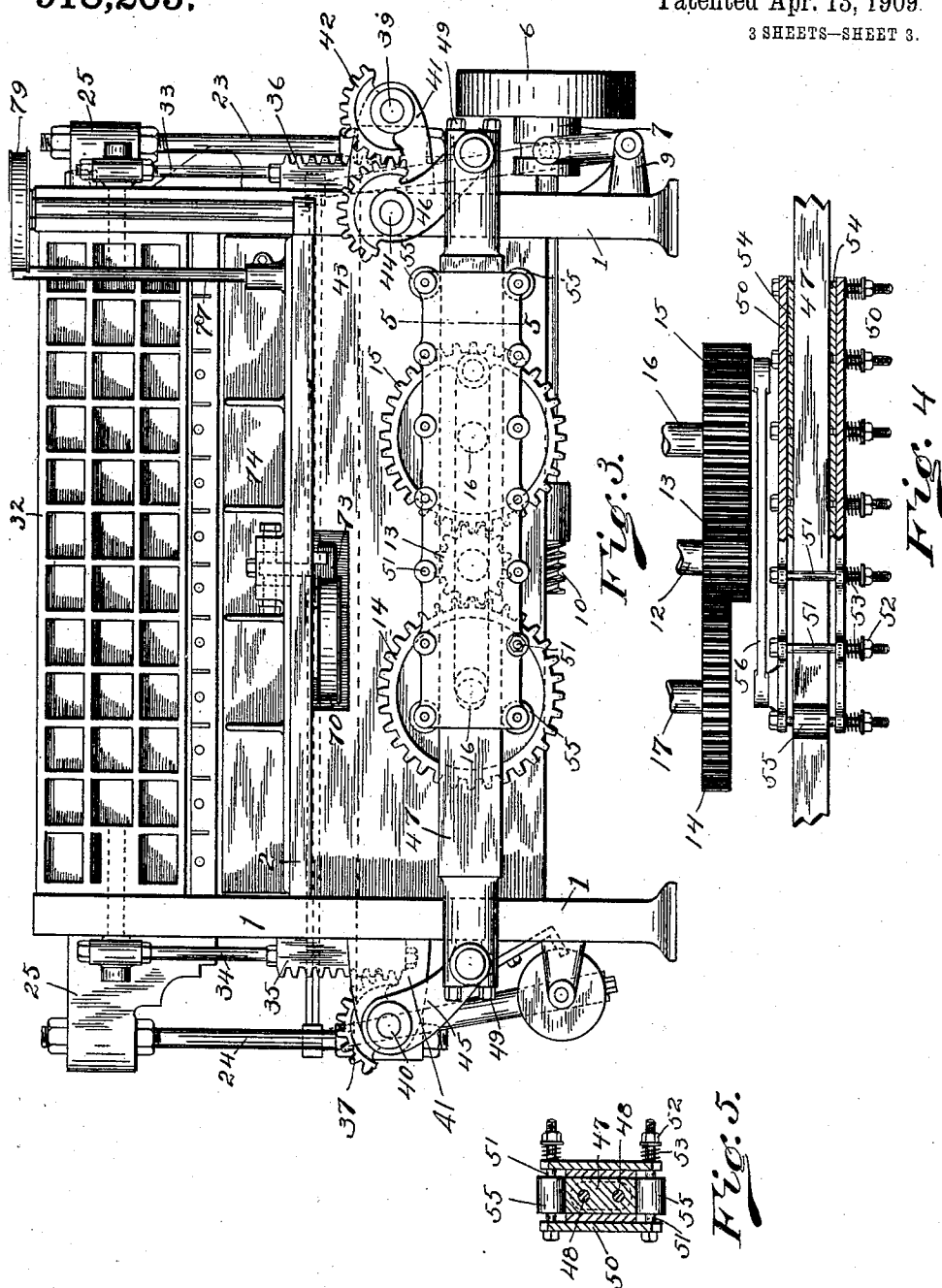
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PAPER-CUTTING MACHINE.

No. 918,205.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed June 27, 1906. Serial No. 323,690.

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, and resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvements relate to machines for the cutting of paper stock, and the purpose of my invention is to provide a construction of machine which shall be of the highest efficiency for any desired width of stock to be cut.

In paper cutting machines with power clamps, the driving power is connected with the clamp by some construction of friction clutch in order that when the clamp has compressed the paper to its maximum limit, the power connection therewith may slip to permit the driving power to operate the knife for the cutting stroke, while maintaining the full clamping pressure on the stock under treatment. Various constructions of friction clutches for this purpose have long been in use, their efficiency being dependent on the extent of frictional surface exposed to the action of the clutch. In paper cutting machines as heretofore constructed, this frictional clutch connection between driving power and clamp has been usually located at one side of the machine, and as it is of the utmost importance that the maximum amount of clamping pressure shall be realized within the capacity of the machine, it is usual to furnish as much frictional surface for the clutch as possible with machines of only moderate width. As the machines are increased in width for the wide sizes of paper stock, the capacity of the friction clutch can not under the ordinary constructions be correspondingly increased for lack of space.

In very wide machines, the rock shaft, or other connection between the pulling bars of the clamp on either side, is necessarily of such a length that as the power is primarily applied at one end, there is a marked tendency of the rock shaft, or of the connecting means, to twist, and a uniform application of the power on the clamp bars is prevented.

It is the primary object of my invention to overcome this difficulty by that certain novel construction of clamp coupling mech-

anism, to be fully pointed out and claimed, whereby in the construction of very wide machines, the capacity of the clamp clutch shall be limited only by the width of the machine, so that no matter what the width, the necessary clamping pressure may be correspondingly maintained. By my novel construction, I also apply my power equally and uniformly at each end of the clamp, obtaining a uniform pressure without any liability of straining or twisting the connecting mechanism.

Other features of novelty will also be hereinafter particularly pointed out and claimed.

In the drawings Figure 1 is a front elevation of my improved machine. Fig. 2 is a side elevation of same. Fig. 3 is a rear elevation. Fig. 4 is a detail plan view, partly in horizontal section, of the clamping driving friction clutch. Fig. 5 is a cross section of same on the lines 5—5 of Fig. 3.

1—1 are side standards, 2 the table, 3 a rear standard or support for the table, and 4 a cross brace, which, with suitable cross braces underneath the table, form a solid and substantial framework and housing for the operating parts.

5 is the main driving shaft of the machine journaled in suitable bearings in the side standard and housing, and provided with the driving pulley 6 loosely mounted on the driving shaft, and connected therewith with an ordinary construction of friction clutch actuated by the sliding collar 7 shifted by the lever 8 pivoted at its lower end on the arm 9 extending out from the side standards. This driving shaft carries the worm 10 on its inner end, which in turn meshes with the worm gear 11 on the shaft 12 journaled in suitable bearings in the center braces of the framework. This shaft carries the pinion 13, which meshes with the two gears 14 and 15, which are mounted on short shafts and 17, journaled in the framework underneath the table, and these shafts at their front ends carry the cranks 18—19, the outer ends of which ride in the diagonal slots 20—21 formed in the massive cam plate 22, the ends of which are guided vertically in suitable guideways in the side standards, and the outer ends of which are securely bolted by the rods 23—24 to the outer ends of the knife carrier plate 25, to which a knife is secured. The cam plate 22 is also provided with the diagonal slots 26—27, which

are engaged by rollers 28—29 on the side frame to guide and steady the movement of the cam plate. The knife carrier plate 25 also carries a roller (not shown) which engages in a slotted guideway 30 secured to the side standard. It will be evident from this construction, that as the shafts 16 and 17 are rotated by the driving power, the cam plate, and with it the knife carrier and knife, will be given a vertical reciprocating movement in a diagonal direction to give a shearing cut to the knife.

32 is the clamp bar for clamping and holding the paper piles under the action of the cutting knife. This clamp bar slides vertically in suitable vertical slots in the side frame, and is connected at its outer ends by the pulling bars 33—34, with the rack bars 35—36, attached thereto, and these rack bars are actuated by the segment gears 37—38 mounted on rock shafts 39—40 journaled in lugs 41—41 projecting from the side of the frame. The rock shaft 39 carries a duplicate segment gear 42, which meshes with the segment gear 43, mounted on the rock shaft 44 journaled in the frame, and the rock shafts 40 and 44, or the segment gears 37 and 43 are coupled by the arms 45—46 to either end of a horizontally disposed connecting bar 47. For strengthening this connecting bar 47, two steel rods 48—48, shown in section in Fig. 5, run lengthwise of the connecting bar through holes cast therein, the tension of the rods being tightened by the nuts 49. Surrounding the connecting bar 47 for about three-quarters of its length is a frictional box made up of side plates 50—50 secured together by the bolts 51—51 above and below the edge of the connecting bar, and these frictional plates are tightened by the nuts 52 against the tension of the coiled springs 53 mounted on the bolts between the nuts, and one of the side plates. Strips of leather 54—54, or other suitable material, are interposed between the frictional plates 50, and the bar, so that by tightening the nuts 51 any desired clamping pressure can be obtained between the frictional plates and the bar to secure the frictional box and the connecting bar together, while at each end of the friction box rollers 55 are provided to sustain the frictional box and guide it in its necessary movement on the bar 47.

One of the gears driven by the main pinion 13, as 15, is provided with a crank which is coupled by the connecting bar 56, with one end of the frictional box, so that by the rotation of the gear 15, the frictional box and connecting bar 47 will be reciprocated horizontally to rock the rock shafts 40 and 44 through the medium of the connecting arms, 45 and 46, and this movement will draw down the clamp bar 32 to compress the paper for the action of the knife. The movement of the clamp plate is so timed as to be

slightly in advance of the movement of the knife carrier, and knife, so that the clamp meets and compresses the paper stock before the knife reaches the paper. When full and complete compression within the limits of the frictional clutch between the frictional box 54 and the connecting bar 47 is obtained, the further rotation of the gear 15 causes the friction box to slide on the bar 47.

It will be noted that by means of the above described connection between the driving mechanism and the clamp I have provided a frictional clutch connection that is applicable to any width of machine.

By arranging my friction clutch horizontally underneath the table, and connecting same directly to each end of the clamp pulling bar construction, the wider the machine the more effective my friction clutch, for it is obvious that the more space provided between the side frames of the machine, the longer the friction box can be constructed. The movement of the friction clutch construction is a direct push and pull, and there is no tendency whatever for any rock shaft or connecting mechanism between the pulling bars of the clamp on each side of the machine twisting. The bar 47 positively connecting the two rock shafts through the medium of which the clamp is actuated, has the power applied to it in the direction of its greatest strength, and any desired size of bar can be employed, and the bar further strengthened by steel rods as hereinbefore described.

In order to apply the power on the pulling bar on the clamp at each end equally, I provide the double set of segment gears 42—43 at one end to reverse the movement of the gears 37—38, as will be obvious.

Not only am I able to supply an entirely effective clutch construction for my clamp, notwithstanding any desired width of machine, but I am also enabled to arrange the friction clutch connection underneath the table, and entirely out of the way.

In order that the machine may be stopped automatically upon the completion of each knife stroke through the paper, and back to its starting point, I provide as follows: The lever 8, through which the clutch mechanism on the driving shaft is actuated to couple the driving pulley with the shaft, is extended upward, and connected by the horizontal bar 58, with a corresponding lever 59 secured to the shaft 60, journaled in suitable bearings on the opposite side standard of the machine. By shifting this bar 58 to the left, as shown in Fig. 1, the clutch will be thrown into connection with the driving pulley to start the machine.

In order that the machine shall not be started accidentally, the connecting bar 58 is mounted to rock in the upper ends of the levers 8 and 59, and this bar 58 carries at

one end the arm 61 connected by the connecting rod 62, with the bell crank lever 63 pivoted in the lug on the lower end of the lever 59, and the opposite arm of this bell crank lever is coupled by the bar 64 with the collar 65 secured by a spline on the shaft 60, so as to rock therewith, but adapted to be shifted laterally thereon. This collar 65 carries the arm 66 provided with a roller on the end thereof, which engages the L-shaped hook 67 when the machine is at rest, which hook is securely bolted to one end of the cam plate 22. It will be evident from this construction, that until the bar 58 is rocked, it will be impossible to shift the levers 8 and 59, the arm 66 being held in engagement with the hook 67. By rocking the connecting bar 58 by the hand lever 68, the arm 66 and collar 65 will be shifted to release the hook 67, so that the levers can be shifted to start the machine. 69 is a brake wheel mounted on the rock shaft 60 to bear against the face of the side standard to prevent a too ready shifting of these levers. As soon as the hand lever 68 is released, the bar will return to its normal position, either through the weight of the hand lever, or when assisted by a suitable spring, not shown, and the roller on the end of the arm 66 will return into the pathway of the hook 67, so that as the cam plate reaches the limit of its up-stroke, it will positively engage the arm 66, and throw the levers 8 and 59 to the right, as shown in Fig. 1, releasing the driving clutch, and stop the machine.

In order that the means for adjusting the back gage for the paper stock on the table may be out of the way, so that the machine can be filled from the side, I arrange this adjusting mechanism below the table, and at one side of the table.

70 is a pulley mounted horizontally under the edge of the table, and actuated by the hand wheel 71, and the belt 72 from this pulley runs over a corresponding pulley at the rear end of the table underneath the same. The belt 72 is connected by the connecting piece 73 with the middle portion of the back gage 74, which extends across the table from side to side, the connecting piece 73 extending up through a slot in the table. By releasing the brake shoe 75, by the hand wheel 76, and turning the hand wheel 71, the back gage may be shifted to any position desired. For gaging this position, the back gage is provided at one side with a vertical arm 77, which is attached to the graduated tape 78 running over the pulleys 79 and 80 at the rear and front of the table at one side.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a machine of the class described, driving mechanism, and a clamp for the

paper stock, means for operating the clamp from each end simultaneously, mechanism connecting each of said clamp operating devices, and a longitudinally acting friction connection interposed between the said connecting mechanism and the driving mechanism.

2. In a machine of the class described, driving mechanism, and a clamp for the paper stock, pulling bars attached to each end of said clamp, means on each side of said machine for actuating said pulling bars, and mechanism connecting each of said clamp actuating devices across the machine, with a longitudinally acting friction connection interposed between said connecting mechanism and the driving mechanism.

3. In a machine of the class described, driving mechanism, and a clamp for the paper stock, pulling bars attached to each end of said clamp, racks attached to each of said pulling bars, and gears for actuating same, mechanism connecting said gears across the machine, with a longitudinally acting friction connection interposed between said mechanism and the driving mechanism.

4. In a machine of the class described, driving mechanism, and a clamp for the paper stock, pulling bars attached to each end of said clamp, racks attached to each of said pulling bars, and gears for actuating same, a bar connecting said gears across the machine, and a longitudinally acting friction connection connecting said bar with the driving mechanism, whereby said clamp may be actuated uniformly from each side of the machine.

5. In a machine of the class described, driving mechanism therefor, and a clamp for the paper stock, means for operating the clamp from each end simultaneously, a bar positively connecting said operating means across the machine, and a longitudinally acting friction connection interposed between said bar and the driving mechanism for actuating said bar to operate the clamp.

6. In a machine of the class described, driving mechanism therefor, and a clamp for the paper stock, means for operating the clamp from each end simultaneously, a bar positively connecting said operating means across the machine, and a friction box inclosing said bar, with connection for said box with the driving mechanism for actuating said bar frictionally to operate the clamp.

7. In a machine of the class described, driving mechanism, and a clamp for the paper stock, pulling bars attached to each end of said clamp, with racks attached to said pulling bars, and gears for operating same, with a bar extending across the machine horizontally connecting said gears,

and a friction box inclosing said bar, with connection for said box with the driving mechanism for actuating said bar frictionally to operate the clamp.

- 5 8. In a paper cutter, driving mechanism therefor, and a clamp, means for drawing down the clamp at each end, a bar positively connecting said means across the machine, and a box frictionally secured to said
10 bar, with means for reciprocating said box actuated by the driving mechanism.

9. In a paper cutter, driving mechanism

therefor, and a clamp, pulling bars at each end of the clamp, racks thereon, with segment gears meshing with the racks, a bar 15 connecting said segment gears arranged parallel to the clamp, and a box frictionally secured to said bar, with connection for the box to the driving mechanism for operating same.

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