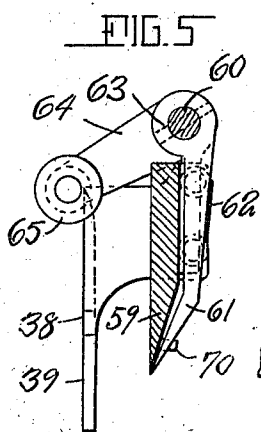
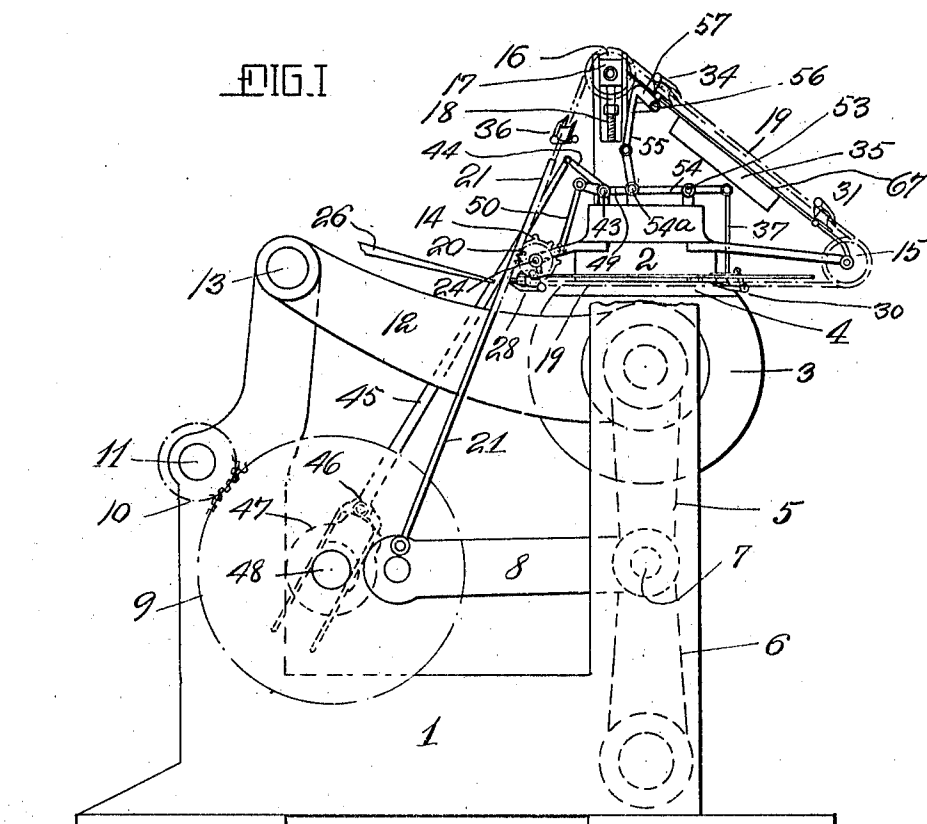


L. E. MORRISON.
GRIPPING MECHANISM FOR PRINTING MACHINES.
APPLICATION FILED JAN. 17, 1908.

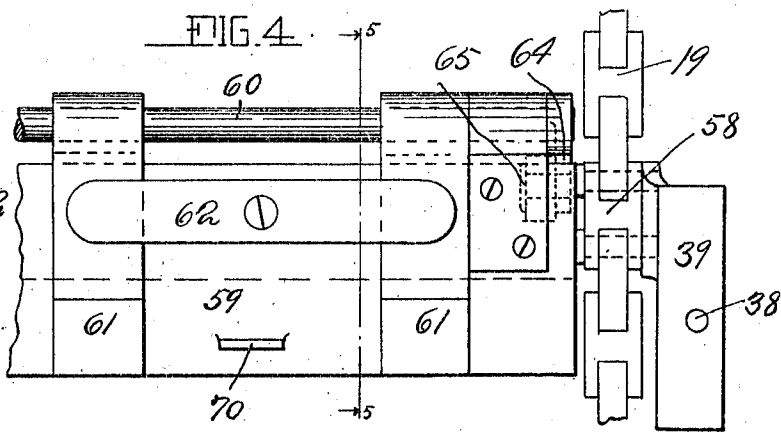
993,613.

Patented May 30, 1911.

2 SHEETS-SHEET 1.



Witnesses
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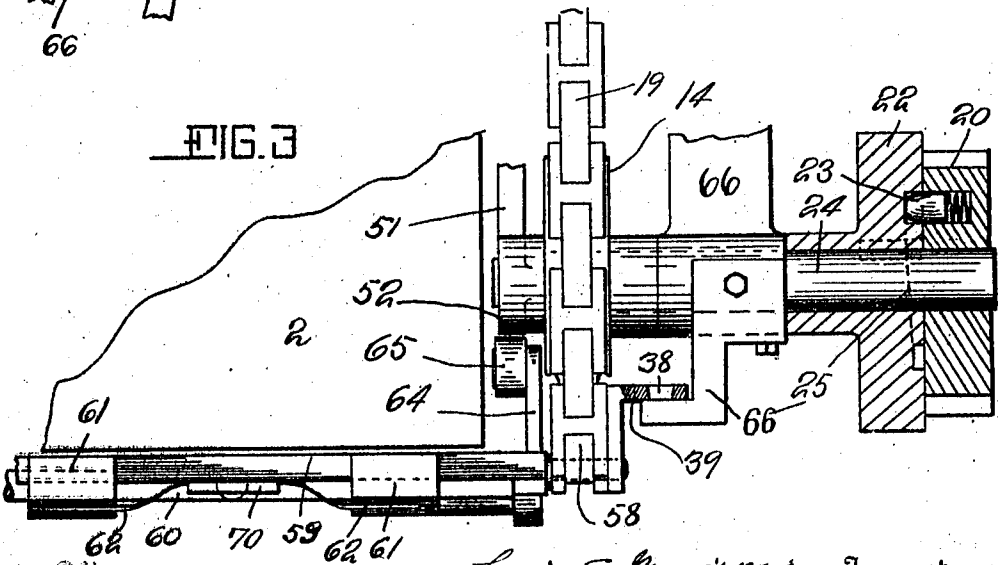
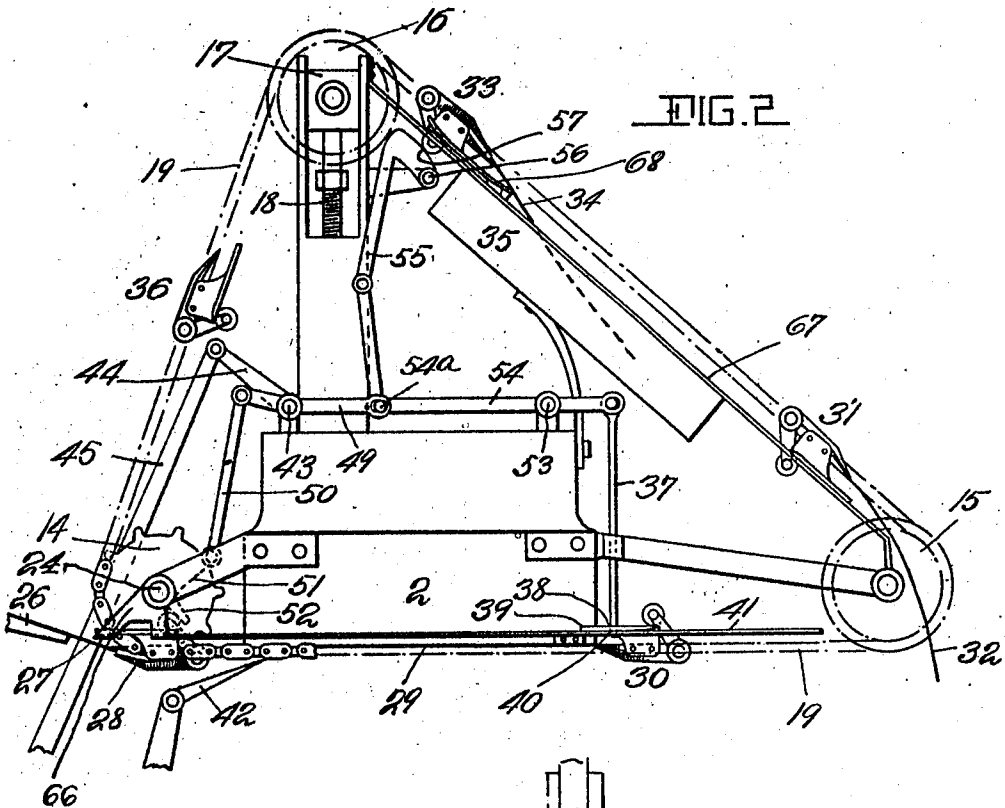
By his Attorney
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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GRIPPING MECHANISM FOR PRINTING-MACHINES.

993,613.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed January 17, 1908. Serial No. 411,248.

To all whom it may concern:

Be it known that I, LEWIS E. MORRISON, a citizen of the United States of America, and a resident of the city of Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Greeting Mechanism for Printing-Machines, of which the following is a specification.

This invention relates to gripping mechanism for printing machines and has more particularly reference to a gripping mechanism for use on high speed automatic platen printing presses, of a construction such as outlined in my application, filed Jan. 2, 1907, Ser. No. 350,516, but of course, the present invention may also be adapted to other kind of presses.

The object of the invention is to provide a simple and effective gripping mechanism adapted to be operated at very high speed without danger of breaking or getting out of order. Hence I embody my invention in the form of a gripping mechanism comprising primarily an endless conveyer, suitably driven and guided, and provided with sets of grippers for seizing the sheet to be printed, to support it while the printing takes place and to deliver the sheet, printed side up.

My invention further comprises means for relieving the conveyer of all strains; and I also provide means, which to the best of my knowledge, are novel in this art, for positioning the grippers on the endless conveyer, before the printing is done, whereby a perfect register is obtained.

To this end my invention consists of such elements and arrangements of parts as will hereafter more fully appear, while reference is had to the accompanying drawings, in which the invention is shown in its preferred form; although I do not wish to be limited to the precise form shown.

The detailed construction will be described in the following specification and the novel features pointed out in the claims.

In the said drawings Figure 1 is a side elevation of a printing machine, as outlined in the application above referred to and provided with my improved gripping mechanism, some details being omitted. Fig. 2 is an enlarged detail view of the gripping mechanism proper with some parts removed. Fig.

3 is a detail view of parts of the gripping mechanism looking from the front of the machine. Fig. 4 is a bottom view of parts shown in Fig. 3 and Fig. 5 is a sectional view on line 5—5 of Fig. 4.

In the drawing the reference numeral 1 indicates the frame of a printing machine to which my improved gripping mechanism has been attached.

2 indicates the platen, which in this instance is stationary, while 3 is the form carrying member having the form 4. The form carrying member is in this machine oscillating and is oscillated by means of the toggle links 5 and 6 connected at 7 to the crank 8 which in turn is mounted on the gear 9 driven from pinion 10 on main shaft 11 to which power is applied in any convenient form. The member 3 is rigidly fixed in a pair of swinging arms 12 pivoted on the frame at 13. As the gear 9 rotates the toggle links are alternately closed and straightened and carry the form member with them, imparting an oscillatory motion to the latter, swinging around pivot 13.

Referring now more particularly to the detail views, it will be seen that on the platen are mounted sprocket wheels 14, 15 and 16 by means of brackets or otherwise. Sprocket wheel 16 is mounted in a box 17 which is adjustable by means of the bolt 18. In this manner I take up wear in the chain 19 which is in mesh with the wheels. The sprocket wheel 14 is the driver and is driven intermittently by means of gear 20 and rack 21, (Fig. 1), through pin 23 in gear 20 operating ratchet 22. This construction is shown in Fig. 3. The parts are so arranged that when the rack moves down the pin engages the ratchet or disk 22 in the usual manner and rotates the shaft 24, while when the rack moves up the pin moves idly in the tapered groove 25. This construction has certain advantages to be pointed out later. Thus it will be clear that the chain 19 is driven intermittently on every down stroke of the rack 21, which latter may be conveniently mounted on the crank 8. On the chain 19, of which there is one on each side of the platen, I have mounted five sets of grippers, so spaced on the chain, that when one set is ready to receive the sheet, the preceding set

of grippers is supporting the leading edge of the sheet which is being printed. The sheet is fed from any suitable feeding mechanism, preferably an automatic feed and of which the feed board—or in platen presses the registering table—is indicated at 26. This will be clear from Fig. 2 which shows the parts in the position with the impression on. In this view the character 27 indicates sheet being fed onto the set of grippers 28 nearest the front, while another sheet 29 is being held up against the platen by the set of grippers indicated at 30. At 31 is shown a third set of grippers, gripping a printed sheet 32 and about to carry it to the point of delivery, while at 33 is shown a set of grippers about to deliver a sheet 34 in the delivery receptacle 35. 36 indicates the fifth set of grippers on the downward traveling portion of the chain.

From the above it will be seen that the two sets of grippers 28 and 33 are being opened at once, and in the drawing is further shown a pin 37 which serves to position a set of grippers when the same arrive at the rear edge of the platen by being moved down through a hole 38 in a lug 39 of the gripper set and registering said hole with another hole 40 in the track 41. The lug 39 thus acts as a registering means for the chain and grippers.

While the printing takes place the rear edge of the sheet is supported by a member as 42, which indicates a swinging yielding brush, which is moved down to allow the grippers to pass and immediately thereafter moves up so that the sheet is dragged out between this member and the platen. The particular construction and operation of this member are fully set forth in the application above referred to and form no part of this invention.

The movement of the various sets of grippers can now be understood and is as follows. In the position shown in Fig. 2 the impression is on,—the form not being shown.—Just before the form leaves the platen the pin 37 moves up, the grippers 28 and 33 close, respectively after taking and delivering a sheet, and the sprockets are driven anti-clockwise so that the grippers travel a distance equal to the distances between the different sets. This motion results in the sheet 27 being placed under the platen. Now the pin 37 moves down positioning the grippers 28 before the next impression and the two sets of grippers at the receiving and delivering point are open, and so on.

The means for operating the individual sets of grippers and the pin 37 will now be described. Mounted transversely on the platen beam is a rock shaft 43, which is rocked by means of the arm 44, link 45, carrying cam roll 46 coacting with cam 47 on

shaft 48. As this cam rotates the shaft 43 is rocked. On one end of the latter is fixed a lever 49 intermediate its ends. Connected to the front end of this lever by means of the link 50 is a bell crank pivoted on shaft 24. The one arm 51 of said bell crank is connected to the link, while the other arm 52 acts as a cam to open the gripper set, which happens to be in the position to receive a sheet. Also pivoted intermediate its ends at 53 is another lever 54 connected by pin and slot connection, to the lever 49 and carrying at its rear end the pin 37. At the common pivot 54^a of these two levers is connected a jointed link 55 pivoted at 56 and having the cam surface 57 for opening the grippers at the point of delivery. The operation of these parts is as follows: Immediately before the impression takes place, shaft 43 is rocked downwardly and the different levers, links and connecting parts assume the positions shown in Fig. 2, that is, the two sets of grippers are opened and the pin 37 positions the one set for printing. After the printing is done, the rock shaft 43 is rocked upwardly with the result that the pin 37 is moved up, the cam 52 leaves the grippers 28 and the same close on the sheet to be printed, the cam 57 moves down and grippers 33 close after having delivered the sheet in the receptacle 35. The chain is now driven and the operation repeated.

The individual gripper set is constructed as follows: see Figs. 3, 4 and 5. Fastened to a link in the chain on each side and indicated at 58, Fig. 4, is an upper gripper jaw 59, which stretches transversely of the machine between the two chains, thus being always kept in the same fixed position parallel to the axis of the form member. On said jaw is mounted a gripper shaft 60 which carries the individual lower gripper jaws 61, which are kept closed against the upper jaw by the spring 62. The lower gripper jaws are held on the gripper shaft 60 by pins as 63 and in fastening these two parts together the holes for the pin in the gripper's jaws are made slightly larger than the holes in the shaft, so that each jaw gets a certain amount of play, which brings it under the tension of the spring, so that no adjustment of the lower jaws is necessary after they have been fixed in the shaft. This insures individually spring actuated grippers. On the one end of the gripper shaft is mounted an arm 64 carrying the roller 65 for opening the grippers by contact with either the cam 52 or 57 as above described. Outside the chains on the links 58 is mounted the registering lug 39 having the hole 38 for registering with the hole 40 in track 41 aforesaid. While the grippers are being opened to receive a sheet the lug 39 rests on the feet of the bracket 66 one on either side, the said feet of these brackets being level with and

forming the beginning of the track 41 as seen in Fig. 2, and at the same time the lugs on the grippers at the delivering point rest on a track 67, and under a rail 68. In this manner the strain of opening the individual gripper sets is removed from the chain and put on the tracks, and while moving, the registering lugs 39 are supported on the tracks as shown, thus taking the weight of grippers on the chains. On the downward travel in front no tracks have been found necessary. The upper gripper jaw 59 carries one or more stops 70 against which the leading edge of the sheet is registered as it passes into the grippers.

From the above it will be clear that as the five upper gripper jaws are rigidly fixed to certain links in the chains, they cannot vary their position, but must travel parallel to one another; further, that all weight and strain are removed from the chains as the grippers are supported on the tracks, both while being opened and while traveling. It will also be seen that although the sheet is printed on the underside it is delivered printed side up within convenient reach for examination.

The reason an ordinary ratchet and pawl mechanism for driving the chains has not been employed is this: that while making ready or inspecting the press, the same is operated by hand and every turn in the driving direction of the rack would result in rotation of the shaft 24 carrying the driving sprockets 14, hence the grippers would be apt to become out of position. But with the mechanism employed, the press may be turned back and forth and only when the pin 23 can enter the groove 25 at its deepest point the grippers will move, and that will always be when the grippers have the right position with relation to the other parts.

From the above it is thought that my invention in its details of construction and operation is clear. In practice it has been found that a gripper mechanism constructed on these lines can be operated successfully at

very high speed, as no motion is lost as in the case of reciprocating gripper.

I claim:—

1. In a gripping mechanism the combination of conveying means, a plurality of rigid gripper bars carried thereon, movable gripper jaws mounted on said bars, register means carried by the said conveying means and adjacent each set of grippers, guiding means for the said grippers, the said register and guiding means being provided with register openings, and a vertically reciprocating rod adapted to penetrate the said register openings in the said register means and the said guiding means at a given point.

2. In a gripping mechanism the combination of an endless conveyer, grippers carried thereby, a perforated guiding member for each gripper secured to the said conveyer, a fixed perforated member, a register member for penetrating the said two perforated members to position the grippers at a given point, movable cams for opening the grippers and operating connections between the said register member and the said cams for operating the same simultaneously.

3. The combination of an impression member, a sheet receptacle fixed above the same, grippers, movable means for causing the said grippers to travel below the said impression member and above the said sheet receptacle, gripper opening cams pivoted at the front end of the impression member and adjacent the said receptacle, means for registering the grippers at the rear end of the impression member, connections between the said cams and the said registering means and mechanism for operating the said connections intermittently and simultaneously.

Signed at New York, N. Y., this 11 day of Jan. 1908.

LEWIS E. MORRISON.

Witnesses:

IVAN KONIGSBERG,
GEO. A. HOFFMAN.