Sept. 27, 1927. 1,643,482

A. ZIMNIEWICZ

SHEET STACKING MECHANISM

Filed Dec. 15, 1924 2 Sheets-Sheet 1

Fig. 1.

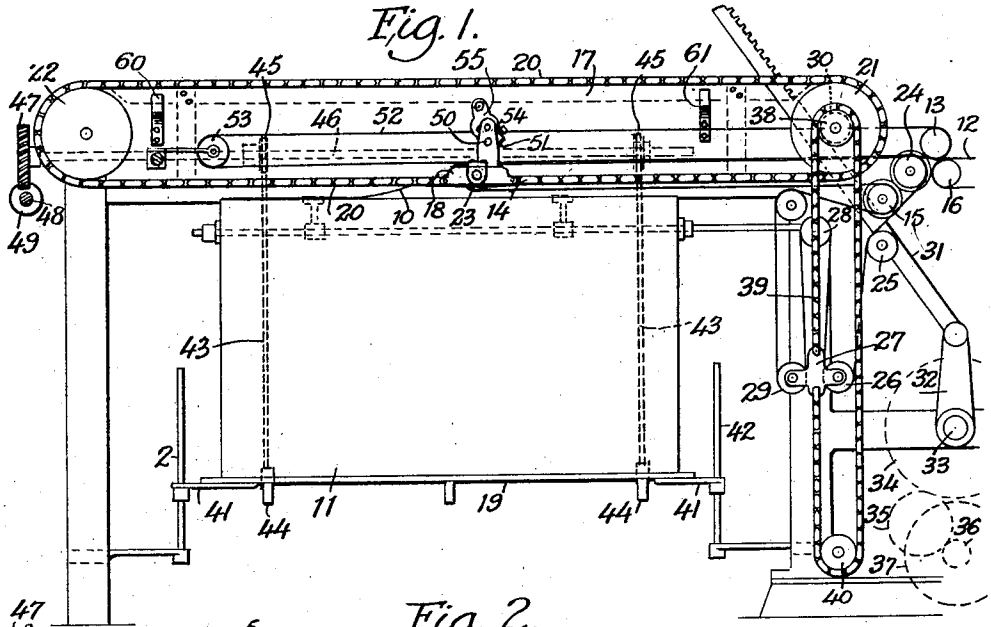
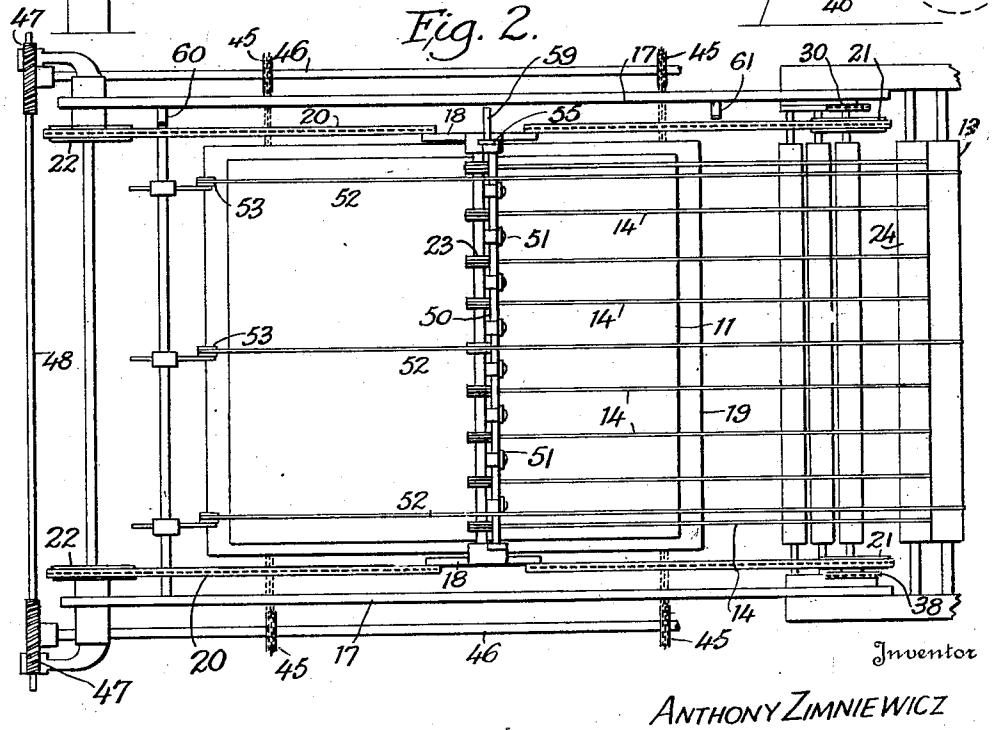


Fig. 2.



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Fig. 3.

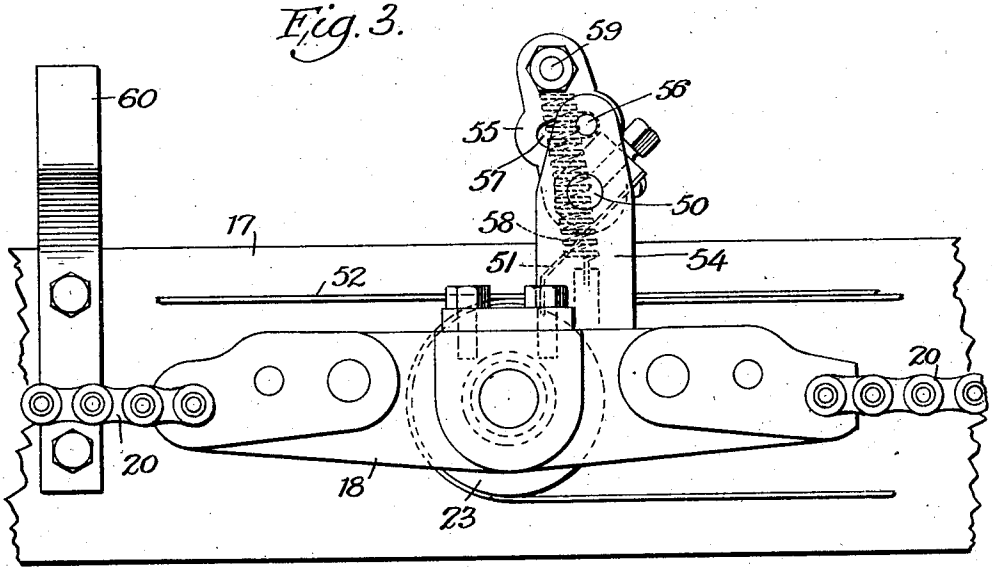
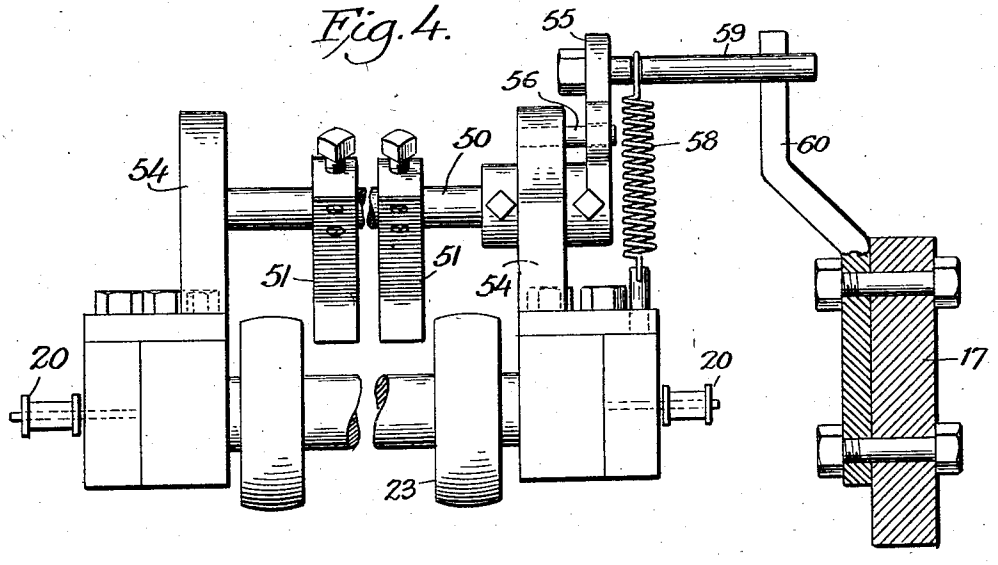


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANTHONY ZIMNIEWICZ, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO MIEHLE PRINTING PRESS & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SHEET-STACKING MECHANISM.

Application filed December 15, 1924. Serial No. 756,113.

My present invention relates generally to mechanism for stacking paper sheets, and more particularly to a mechanism of this character such as employed in an associating and delivery apparatus utilized in connection with newspaper printing presses as in my application for such an apparatus filed of even date herewith.

Among its many objects, my invention aims to provide a mechanism of the present character by means of which cut sheets may be continuously piled or stacked in an even uniform manner, as well as an apparatus which will be continuously effective without requiring constant care and attention and will be economical both in first cost and upkeep.

With the above and certain other objects in mind, my invention may be better understood and more thoroughly appreciated from the following description thereof, referring to the accompanying drawings which form a part of this specification, and in which:

Figure 1 is a side view of the mechanism embodying my invention,

Figure 2 is a top plan view thereof,

Figure 3 is an enlarged detail side view of the carriage, and

Figure 4 is an end view.

Referring now to these figures, the cut sheets 10 to be piled or stacked upon the stack indicated at 11, are fed to the mechanism upon feed tapes 12 and through pressure rollers 13 which insure the proper delivery of one sheet or a series of superimposed sheets to the upper rear portion of the stacking tapes 14 which, as shown, pass forwardly around a roller 15 located immediately in front of the forward roller 16 of the feed tapes 12.

In their forward extension from the roller 15, the stacking tapes 14 pass horizontally between the sides of a stacking frame 17 to a delivery carriage 18 which is movable horizontally in guided relation between said frame sides and in connection therewith and is shifted forwardly and rearwardly over the paper stack 11, the latter on a vertically adjustable table 19. For this purpose the ends of the carriage 18 are attached to the lower runs of endless chains 20 passing around sprockets 21 and 22 at the upper, front and rear portions of the stacking frame 17, which chains are shifted in alternately opposite directions through connections to be presently described.

The delivery carriage 18 supports a freely revoluble roller 23 around which the tapes 14 pass rearwardly to a guide roller 24 thence forwardly around this roller and downwardly around a roller 25. The tapes then pass upwardly around one roller 26 of a vertically movable compensator carriage 27 and downwardly around a stationary roller 28 and then upwardly around the second roller 29 of the compensator carriage to the first mentioned roller 15, it being noted at this point that rollers 15 and 24 are clutch rollers, the clutches of which prevent movement of the rollers except in one direction.

On the shaft of the sprocket 21 is a gear wheel 30 engaged by a rack bar 31, the latter shiftable upwardly and downwardly by the crank 32 of a crank shaft 33, geared by gears 34, 35, 36 and 37 to a suitable driving source. The shaft of sprocket 21 also has a second sprocket 38 which receives the upper portion of a vertically disposed endless chain 39 whose lower portion travels around an idler sprocket 40. To this chain 39 the compensator carriage 27 is attached so that as the stacking carriage 18 moves forwardly the compensator carriage 27 moves upwardly and permits the upper portions of the stacking tapes 14 to be drawn forwardly by carriage 18. As the stacking carriage 18 moves rearwardly the compensator carriage 27 moves downwardly and thus takes up the tapes, permitting those portions of the tapes between the roller 24 and the stacking carriage 18 to remain stationary so as to hold the sheets stationary. Thus in its rearward movement the stacking carriage simply recedes beneath the sheets allowing them to drop onto the stack 11 as shown in Figure 1.

At the front and rear portions of its sides, the table 19, on which the sheets are piled to form the stack 11, has guide brackets 41 slidable vertically on uprights 42 attached to the stack frame 17, and this table is supported by chains 43 whose lower ends are secured to cross battens 44 beneath the table. The upper portions of the chains extend outwardly over sprockets 45 secured upon lengthwise shafts 46, the latter having at their forward ends worm wheels 47. These shafts 46, rotation of which in one direction

slowly lowers the table 19 as the stack of sheets accumulates thereon, are actuated by a cross shaft 48 having worm gears 49 in engagement with the worm wheels 47, the cross shaft being rotated through any suitable connections so as to bring about the desired adjustment of the stack during operation.

Moreover, the carriage 18 supports thereon a rock shaft 50 having a series of projecting fingers 51 therealong which are turned downwardly between the stacking tapes 14 during the forward movement of the carriage 18 so that these fingers together form a shoulder against which the forward edges of the sheets engage to insure alinement of the latter and avoid danger of their movement beyond the carriage. During the forward movement of the carriage the sheets are prevented from upward movement by virtue of tapes 52 parallel with and above the stacking tapes 14 and extending at one end around a roller 53 and at the other end around one of the pressure rollers 13.

The rock shaft 50 is supported in upright end bearings 54, see Figures 3 and 4, and to one end is secured an upstanding lever 55 whose swinging movement is controlled by a pin 56 projecting from the adjacent bearing 54 through an arcuate slot 57 of the lever and thus controls the extent of rocking movement of shaft 50. The lever 55 is held in forwardly and rearwardly inclined positions at the limits of its movement by means of a spring 58 whose lower end is anchored on the carriage and whose upper end engages an outstanding pin 59 at the upper end of the lever 55.

The shaft 50 is rocked so that the fingers 51 swing upwardly and forwardly above the stacking tapes and free of the cut sheets when the carriage 18 reaches the limit of its forward movement. For this purpose the pin 59 of lever 55 engages a stationary trip arm 60 on the forward portion of the stacker frame. In this way when the carriage 18 begins its next rearward movement, the cut sheets are free to drop onto the stack 11. At the limit of rearward movement of the carriage 18 the pin 59 comes into engagement with a trip arm 61 on the stacker frame which acts to shift the rock shaft in the opposite direction and restore the fingers 51 to the downwardly extending effective position shown in Figure 1 and in Figures 3 and 4.

Upon each feed of sheets from the feed tapes 12 onto the upper portions of the delivery tapes 14 which at this time are moving forwardly by virtue of the forward movement of the carriage 18, the rack bar 31 is at this time moving upwardly and when this rack bar starts its next downward movement the carriage 18 commences its rearward movement, during which it recedes beneath the several sheets as before stated so that the latter are free to drop onto the stack 11.

I claim:—

1. In apparatus of the character described, a paper stacking mechanism including a stack supporting table, a carriage shiftable back and forth above the table, delivery tapes having guide rollers certain of which are mounted in said carriage and movable therewith and certain others of which engage the tape upon the opposite sides of its engagement with the carriage rollers and have clutches preventing movement of the tapes in one direction, and a compensating carriage having rollers around which the tapes are extended and operating to compensate for the movement of the delivery carriage in one direction.

2. In apparatus of the character described, a paper stacking mechanism including a stack supporting table, a carriage shiftable back and forth above the table having a roller, rollers carried by a fixed portion of the mechanism, delivery tapes extending around said rollers and constrained to movement in one direction, means for actuating said carriage, and a second carriage having a roller around which portions of the tapes travel and operatively connected to said carriage actuating means to compensate for the movements of said first carriage in one direction.

3. In apparatus of the character described, a paper stacking mechanism including a stack supporting table, a carriage shiftable back and forth above the table, delivery tapes having guide rollers certain of which are mounted in said carriage and movable therein and certain others of which have clutches preventing movement of the tapes in one direction, means for actuating said delivery carriage including sprockets, shafts on which said sprockets are mounted one of which shafts has a gear and a second sprocket, chains connecting said sprockets and to which the carriage is connected, a chain around said second sprocket, a compensating carriage connected to said second chain having rollers around which portions of the tapes travel, a crank shaft having a crank, and a rack bar actuated by the crank and engaging the said gear of one of the sprocket shafts.

4. In apparatus of the character described, sheet delivery tapes, a carriage with which the tapes are constrained to movement in one direction, a stack support beneath the carriage, means to take up and let out the tapes during movement of said carriage, and means to actuate said carriage, said take up means also including a carriage shiftable by said actuating means of the first carriage and during operation of the latter.

5. In an apparatus of the character described, sheet delivery tapes, a stack support, a carriage movable back and forth above said support and with which said

tapes move in one direction, means to take up the tapes during movement of the carriage in the other direction, sheet engaging limiting means movable in connection with the carriage, and means to move said sheet limiting means into, and out of, active position at the limits of movement of the carriage in opposite directions.

6. In apparatus of the character described, a paper stacking mechanism comprising a stack supporting table, a carriage shiftable back and forth above the table, delivery tapes having guide rollers certain of which are mounted on said carriage and movable therewith, others of said rollers being fixed in position and engaging the tapes upon either side of their points of engagement with the carriage rollers, said fixed rollers being adapted to rotate in one direction only.

7. In apparatus of the character described, a paper stacking mechanism comprising a stack supporting table, a carriage shiftable back and forth above the table, delivery tapes having guide rollers certain of which are mounted on said carriage and movable therewith, others of said rollers being fixed in position and engaging the tapes upon either side of their points of engagement with the carriage rollers, said fixed rollers being adapted to rotate in one direction only, certain of them rotating in one direction and others in the opposite direction.

8. In apparatus of the character described, a paper stacking mechanism comprising a stack supporting table, a carriage shiftable back and forth above the table, delivery tapes having guide rollers certain of which are mounted on said carriage and movable therewith, others of said rollers being fixed in position and engaging the tapes upon either side of their points of engagement with the carriage rollers, said fixed rollers being adapted to rotate in one direction only, certain of them rotating in one direction and passing out tape as the carriage moves away from them and others rotating in the opposite direction to take up tape as the carriage returns.

In testimony whereof I have affixed my signature.

ANTHONY ZIMNIEWICZ.