

Jan. 31, 1928.

1,657,595

G. W. SWIFT, JR

SHEET DELIVERY AND STACKING MECHANISM

Filed Sept. 11, 1926

2 Sheets-Sheet 1

Fig. 1.

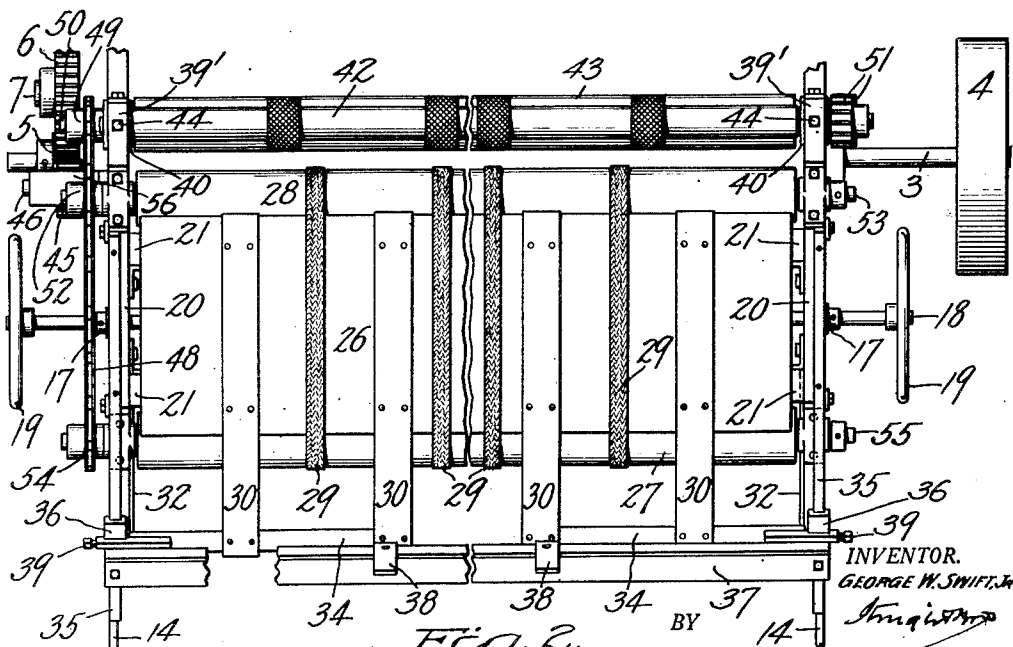
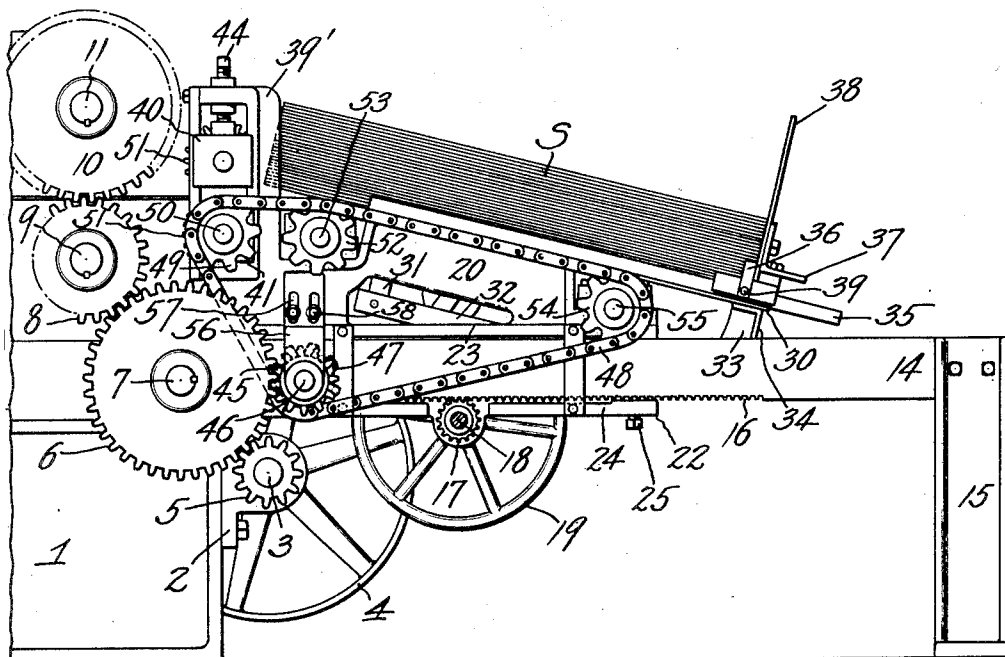


Fig. 2.

WITNESS

Oliver H. Holmes

INVENTOR.
GEORGE W. SWIFT, JR.
BY
ATTORNEYS.

Jan. 31, 1928.

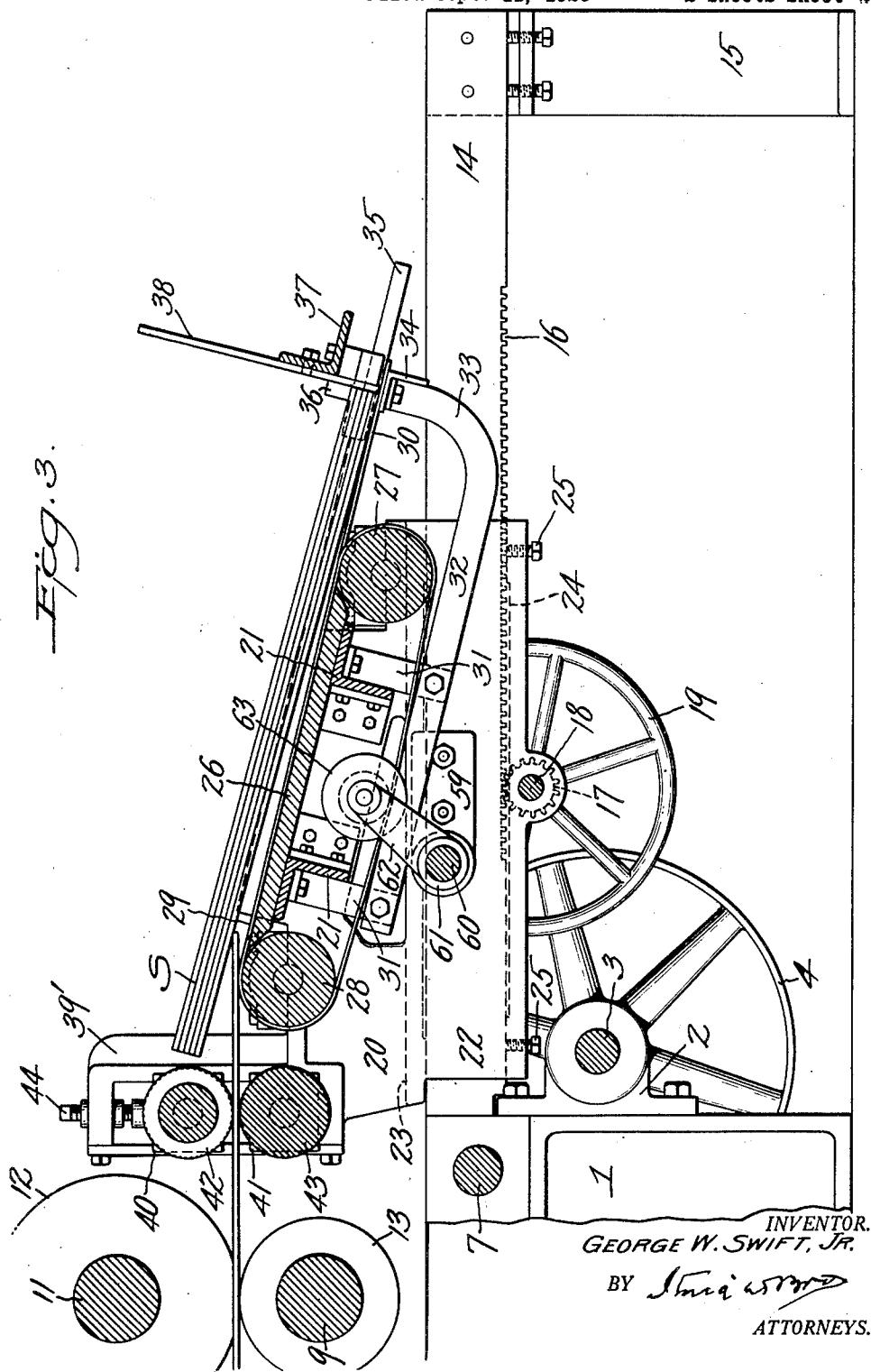
1,657,595

G. W. SWIFT, JR

SHEET DELIVERY AND STACKING MECHANISM

Filed Sept. 11, 1926

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

GEORGE W. SWIFT, JR., OF BORDENTOWN, NEW JERSEY, ASSIGNOR TO GEORGE W. SWIFT, JR., INC., OF BORDENTOWN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHEET DELIVERY AND STACKING MECHANISM.

Application filed September 11, 1926. Serial No. 134,838.

This invention relates to sheet delivery and stacking mechanisms and has for its primary object to provide an improved mechanism of this character whereby successively delivered sheets may be applied to the bottom of a pile of sheets so that the top of the pile may have portions removed therefrom without interfering with the continuous rapid delivery of sheets to a stacking table.

One of the objects of the present invention is to provide an improved arrangement of operating parts in sheet-delivery mechanism of this character whereby the delivery of sheets to the bottom of the pile is facilitated.

Other and specific objects of invention will appear in the specification and be pointed out in the appended claims in connection with the accompanying drawings which show a preferred embodiment of my invention.

In the drawings:—

Figure 1 is a side elevation of one form of sheet delivery mechanism constructed according to the principles of my invention;

Figure 2 is a top plan view of the same, parts being broken away;

Figure 3 is a vertical longitudinal section on an enlarged scale, parts being broken away and parts shown in elevation.

Sheet delivery mechanism of the character shown and described in the present specification is peculiarly serviceable for stacking sheets of heavy paper board or corrugated board which may be received from a machine such as that shown in U. S. Patent No. 1,579,738 which was granted in my name under date of April 6, 1926. Another example of a machine in connection with which my improved sheet delivery mechanism, may be advantageously employed is the box-blank trimming machine disclosed in my copending application Serial No. 100,910 which was filed in my name under date of April 9, 1926. In both of these machines the feed of heavy paper board or corrugated board goes on at such a high rate of speed and the sheets are frequently of such large size that it becomes impracticable to remove portions of the pile from the top during the continued delivery of sheets to the top of the pile.

My present invention contemplates the flatwise delivery of sheets to the bottom of a

pile in order that portions of the pile may be removed from the top without interrupting the operation of the machine.

As shown in the drawings, my invention is illustrated in an adaptation to a box-blank trimming machine. The delivery end of such a machine is indicated on the left of Figures 1 and 3 of the drawings. Mounted upon a base frame 1 are laterally spaced bearing brackets 2 within which is journaled a power shaft 3, said shaft in the present instance, receiving its power thru a belt pulley 4 keyed thereto. Also keyed to the shaft 3 is a spur pinion 5 which meshes with the gear 6 keyed to a cross shaft 7. Also in mesh with gear 6, is a spur gear 8 keyed to a cross shaft 9. Spur gear 8 also meshes with a spur gear 10 keyed to another cross shaft 11 as shown in Figure 3. The upper shaft 11 carries a slitting or blank trimming blade 12 which cooperates with a roller plate 13 carried by the under shaft 9.

Extending forwardly from the side frames 1 of the box-blank trimming machine, are laterally spaced guides or side bars 14, said side bars being supported at their outer ends by uprights 15. Each of the guides 14 is provided along its under edge with a rack 16 with which meshes a spur gear 17 keyed to a cross shaft 18. Said cross shaft 18 is journaled in suitable bearings carried by the oppositely disposed aprons 22 referred to below. Keyed to the outer ends of the cross shaft 18 as shown best in Figure 2 are hand wheels 19 by means of which the delivery table carriage may be moved to and fro along the guides 14. Said carriage comprises laterally spaced side frames 20 connected by transverse angle bars 21 and each having an apron 22 provided with inwardly presented top flanges 23 and bottom flanges 24. The bottom flange 24 on either side frame may be provided with set screws 25 for locking the carriage in any position to which it may be adjusted. A forwardly and downwardly inclined sheet stacking table 26 is mounted upon the angle bars 21, the front and rear edges of said table 26 being arranged to overhang a forward feed roll 27 and a rear feed roll 28 respectively. Said feed rolls have their opposite ends journaled in side frames 20. Traveling over the roll-

ers 27 and 28, are suitable sheet feeding tapes 29, said tapes being arranged between laterally spaced plates 30 which are rigidly secured to the table 26. Angle brackets 31 which are secured to opposite ends of angle bars 21, serve to support laterally-spaced side bars 32, said side bars being provided with upwardly curved forward ends. As shown in Figure 2, oppositely arranged cross bars 34 have their outer ends connected to the side bars 32 while the forward ends of plates 30 are connected to the former at points along its length. Extending along each side of the delivery table 26 and rigidly secured to the side frame 20 is a guide rod 35 upon which is slidably mounted a box guide 36. Extending transversely between the box guides 36 is an angle bar 37 to which is secured a plurality of front edge stacking gages 38. Laterally presented set screws 39 mounted in the box slides 36 adapt said slides to be locked in any position to which they may be adjusted. This adjustment enables a pile of sheets S to be arranged on the delivery table 26 with their rear edge overhanging the fixed plane of feed of the machine to which the delivery mechanism is attached.

In order to provide a suitable mount for a pair of power driven feed rolls between the blank trimming machine and the delivery table 26, each of the carriage side frames 20 is provided with a guide frame 39' within which are mounted upper and lower bearing boxes 40 and 41 for sheet-feeding rolls 42 and 43. A proper setting of the upper roll 42 may be had by screws 44 mounted in the upper arm of guides 39 and bearing on the upper bearing boxes 40.

As shown in Figure 1, a spur gear 45 receives power from the spur gear 6, spur gear 45 being keyed to a shaft 46. Also carried by the shaft 46 in the rear of gear 45 is a sprocket drive gear 47 which is keyed to shaft 46 and drives sprocket chain 48. The sprocket chain 48 extends upwardly and rearwardly over a sprocket wheel 49 keyed to the shaft 50 which drives the lower feed roll 43. The upper and lower feed rolls 42 and 43 are connected by spur gears 51 so as to rotate in unison. A sprocket wheel 52 keyed to the shaft 53 which drives the sheet feeding roll 28, receives power from sprocket chain 48, said sprocket chain also driving a sprocket wheel 54 keyed to the shaft 55 which drives the feed roller 27. Suitable means for taking up slack in the sprocket chain 48, may be provided by journalling the shaft 46 in a vertically adjustable bracket 56, said bracket being provided with slots 57 thru which bolts 58 extend to be threaded into the side frame for securing the bracket 56 in any position to which it may be adjusted.

Secured to the inner faces of the apron

slides 22, are two brackets 59 which carry a cross shaft 60. Freely pivoted on the cross shaft 60, are the hub portions 61 of a plurality of slack take-up arms 62. Journalled in the outer end of each arm 62, is a flanged pulley 63 which bears downwardly against the lower run of belt 29 under the gravity of arm 62 and flanged pulley 63.

Briefly recited, the operation of my improved sheet delivery and stacking mechanism is as follows.

A sheet delivered to the feed rolls 42 and 43 is fed into engagement with the feed roll 28 and tapes 29 under the pressure of sheets S which have already accumulated on the delivery table 26. Under the positively applied pressure of feed rolls 42 and 43, the sheet is driven forwardly until the rear edge of the sheet passes beyond said feed rolls whereupon it assumes a flatwise position upon table 26 and has its forward edge brought into alinement with the pile or stack by means of the front edge gages 38.

I claim:

1. In sheet-delivery mechanism, the combination of a support for a pile of sheets superimposed flatwise one upon another, said support being provided with means for gaging the front edges of sheets for arranging said sheets in a pile, and sheet-feeding rolls arranged on opposite sides of a plane intersecting the upper surface of said support, said sheet-feeding rolls being adapted to cooperate with each other on opposite faces of a sheet propelled thereby into sliding engagement with the bottom of said pile.

2. In sheet-delivery mechanism, the combination with a support for a pile of sheets superimposed flatwise one upon another, of sheet-feeding rolls arranged on opposite sides of and cooperating in a plane which intersects the plane of the upper surface of said sheet-support, means for gaging the front edges of sheets delivered to said sheet-support for arranging said sheets in a pile with their rear edges overhanging that portion of said plane disposed below said upper surface of the sheet-support, and other sheet-feeding means operating along said sheet-support.

3. In sheet-delivery mechanism, the combination with a movable carriage, of a support for a pile of sheets mounted thereon, front and rear feed-rolls journalled on spaced parallel axes in said carriage, and a pair of power-driven feed rolls arranged on opposite sides of a plane of feed intersecting the upper plane of said sheet-support in a line above and adjacent to the axis of said rear feed roll.

4. In sheet delivery mechanism, the combination with a horizontally-adjustable sheet delivery support, of sheet delivery feed rolls partaking of the horizontal adjustments of said support and arranged to deliver sheets

to the bottom of a pile of sheets on said sheet delivery support.

5. In sheet delivery mechanism of the character described, the combination with a horizontally adjustable delivery frame, of sheet delivery feed rolls journaled in said frame, and a sheet stacking support mounted on said delivery frame and supporting a stack of sheets in position to protrude rearwardly above the plane of movement of the forward edge of a sheet which is being delivered by said feed rolls.

6. In a machine of the character described, the combination with sheet delivery feed rolls, of a sheet stacking table inclined downwardly away from said feed rolls, said sheet stacking table being arranged in a plane which intersects the plane of action of said feed rolls in a line adjacent to said feed rolls, and means for imparting horizontal adjustments to said feed rolls and table.

7. In sheet delivery mechanism of the character described, the combination with sheet delivery feed rolls, of a sheet stacking support adapted to support the bottom rear edge of a stack of sheets above the plane of movement of the forward edge of a sheet, which is being delivered by said feed rolls, and an adjustable carriage for said feed rolls and sheet stacking support.

8. In combination with a machine having a fixed plane of feed and rotary parts adapted to operate upon sheets moving in said plane, a sheet-delivery carriage movable towards and away from said machine, a delivery table mounted on said carriage, said delivery table being inclined downwardly and forwardly with respect to said fixed plane of feed, a front-edge sheet-stacking gage mounted on said delivery table, said gage being adapted to locate a sheet-stack with the rear edge of the bottom sheet therein protruding from said delivery table and overhanging said fixed plane of feed, and sheet-feeding belts movable downwardly and forwardly over said delivery table for feeding a sheet from said machine to the bottom of said stack.

9. In combination with a machine having a fixed plane of feed and rotary parts adapted to operate upon sheets moving in said plane, a sheet-delivery carriage movable towards and away from said machine, a delivery table mounted on said carriage, said delivery table being inclined downwardly and forwardly with respect to said fixed plane of feed, a front-edge sheet-stacking gage mounted on said delivery table, said gage being adapted to locate a sheet-stack with the rear edge of the bottom sheet therein protruding from said delivery table and overhanging said fixed plane of feed, sheet-feeding belts movable downwardly and forwardly over said delivery table for feeding a sheet from said machine to the bottom of

said stack, and sheet-feeding rolls journaled in said carriage and operating upon a sheet moving in said fixed plane.

10. In sheet-delivery mechanism of the character described, the combination with an adjustable sheet-delivery carriage, of a delivery table mounted on said carriage, said delivery table being inclined downwardly and forwardly, a front-edge sheet-stacking gage mounted on said delivery table for locating a sheet-stack so that the rear edge of the bottom sheet protrudes rearwardly and overhangs said fixed plane of feed, and sheet-feeding belts movable downwardly and forwardly over said delivery table for feeding a sheet from said machine to the bottom of said stack.

11. In delivery mechanism of the character described, the combination with a downwardly and forwardly inclined delivery table of parallel feed-rollers operating in substantially the upper plane of said delivery table, a front-edge sheet-stacking gage mounted on said delivery table said gage being adapted to locate a sheet-stack with the rear edge of the bottom sheet therein protruding upwardly and rearwardly from said delivery table, sheet-feeding belts movable downwardly and forwardly over said delivery table for feeding a sheet from said machine to the bottom of said stack, and means for driving said feed-rollers in unison.

12. In combination with a machine having a fixed plane of feed, a delivery frame extending forwardly from said machine, a sheet-delivery carriage movable towards and away from said machine along said frame, a delivery table mounted on said carriage said delivery table being inclined downwardly and forwardly with respect to its line of intersection with said fixed plane of feed, a front-edge sheet stacking gage mounted on said delivery table said gage being adapted to locate a sheet-stack with the rear edge of the bottom sheet therein protruding rearwardly from said delivery table and overhanging said fixed plane of feed, and sheet-feeding belts movable downwardly and forwardly over said delivery table for feeding a sheet from said machine to the bottom of said stack.

13. In sheet-delivery mechanism, the combination with a support for a pile of sheets superimposed flatwise one on top of another, of sheet-feeding means adapted and arranged to feed sheets flatwise and singly to the bottom of said pile, means adjustable along said pile support for gaging the front edges of sheets as they are delivered to the bottom of said pile, and sheet-feeding means operating in the plane of said sheet-support for moving said sheets into alignment against said gaging means.

14. In sheet-delivery mechanism, the combination with feed rolls journaled on fixed

axes and operating on a fixed plane of feed, of a sheet-support arranged at an angle to said fixed plane of feed, other feed rolls journaled on axes movable with said sheet-support, and means for adjusting said sheet-support towards and away from the first-mentioned feed rolls. 15

15. In sheet-delivery mechanism, the combination with feed rolls journaled on fixed axes and operating in a fixed plane of feed, 20 of a sheet-support arranged at an angle to said fixed plane of feed and adjustable along the fixed plane of feed in its fixed angular relation thereto, a stacking gage adjustable along said sheet-support, and 25 other feed-rolls journaled on axes which are fixed with respect to said sheet-support.

GEORGE W. SWIFT, JR.