Jan. 8, 1935. R. HITCHCOCK 1,987,339

PAPER FEEDING MECHANISM

Filed Dec. 2, 1929 3 Sheets-Sheet 1

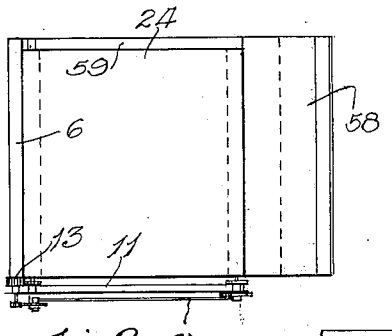


Fig. 2

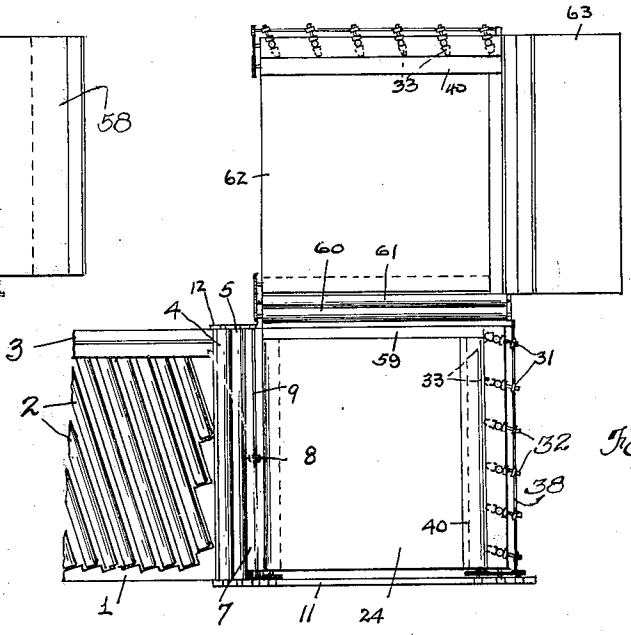


Fig. 1

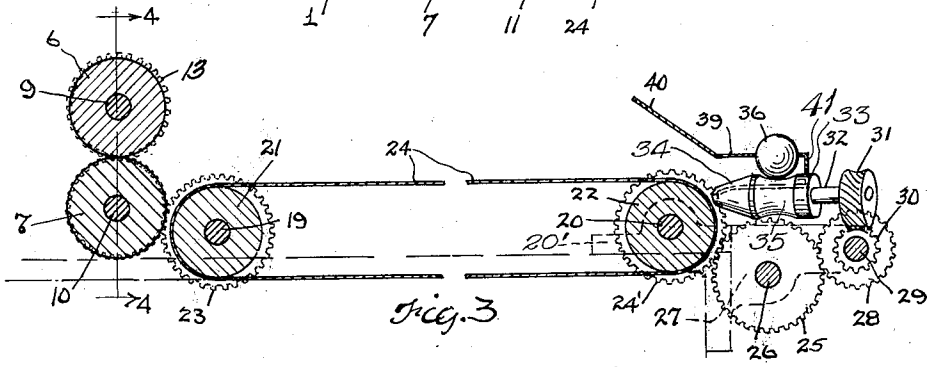


Fig. 3

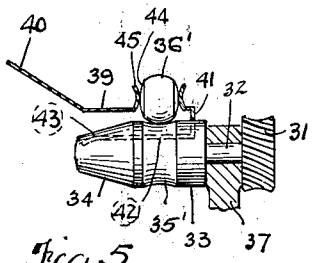


Fig. 5

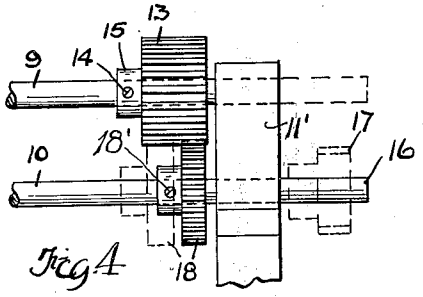


Fig 4

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PAPER FEEDING MECHANISM

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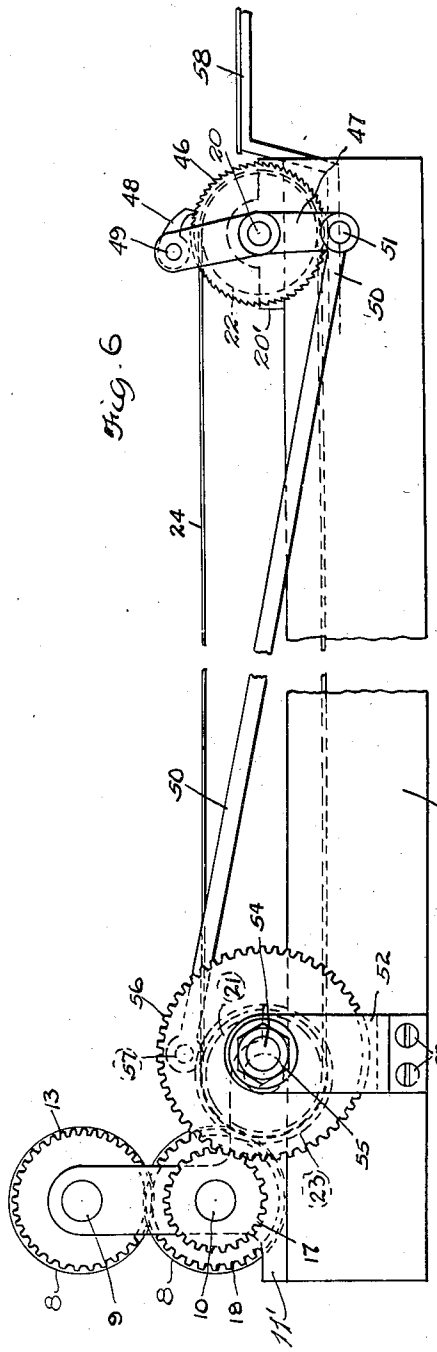


Fig. 6

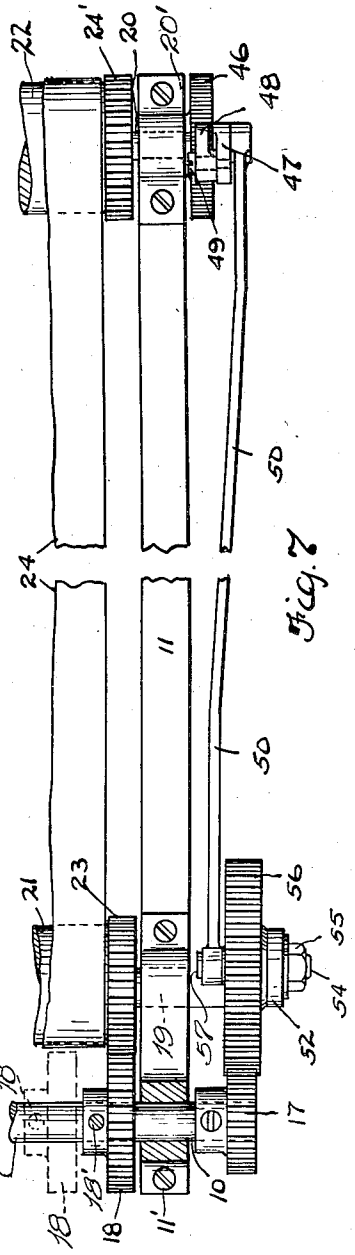


Fig. 7

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Jan. 8, 1935. R. HITCHCOCK 1,987,339

PAPER FEEDING MECHANISM

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Fig. 8

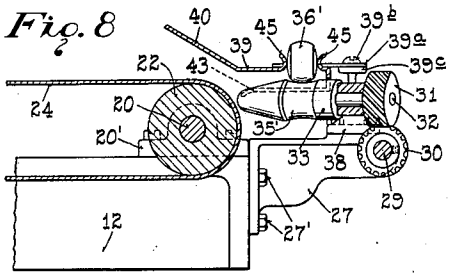


Fig. 10

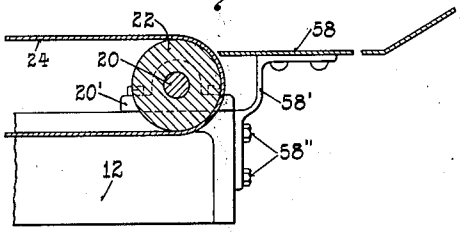


Fig. 9

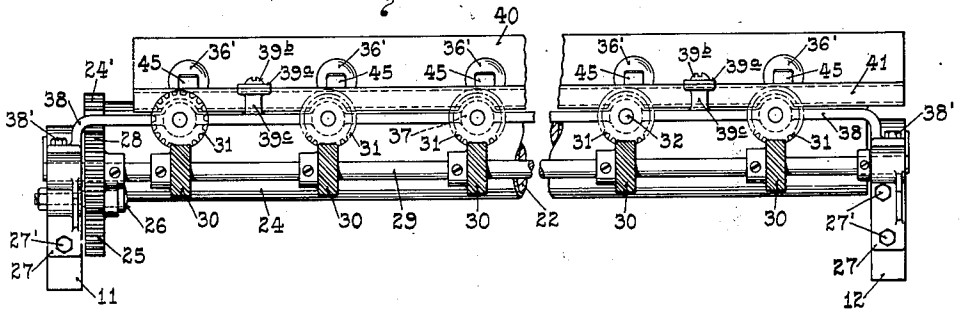
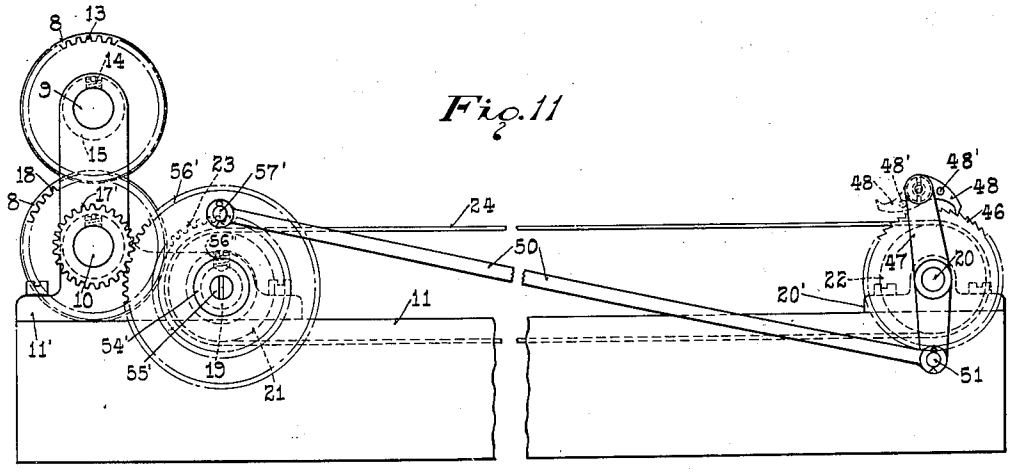


Fig. 11



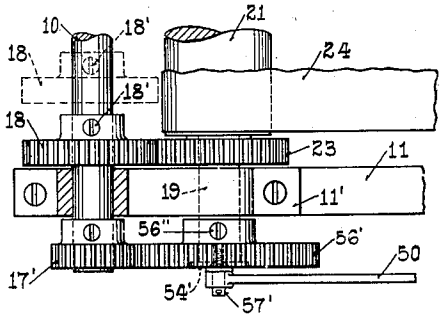


Fig. 12

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Patented Jan. 8, 1935 1,987,339

UNITED STATES PATENT OFFICE

1,987,339

PAPER FEEDING MECHANISM

Reuben Hitchcock, Cleveland, Ohio; Lawrence Hitchcock, H. Morley Hitchcock, D. B. Meacham, and C. W. Hitchcock, executors of said Reuben Hitchcock, deceased, assignors to The Cleveland Folding Machine Company, Mentor Township, Ohio, a corporation of Ohio

Application December 2, 1929, Serial No. 410,932

39 Claims. (Cl. 271—49)

My invention relates, as indicated, to sheet delivering mechanism and has specific reference to an improved means for delivering the sheets from a paper folding or like machine. In connection with paper folding machines it will be understood by those familiar with the art that the folded sheets or signatures after leaving the folding rolls may pass through slitter rolls which cut the large sheets into a plurality of smaller sheets, which are by the slitter rolls in turn delivered therefrom in side by side relation. In the preparation of the various types of signatures or folders which are produced by machines of this type, it frequently is necessary to again fold the small sheets which have been delivered by the aforementioned slitter rolls. Again certain types of signatures or folders require no further operations thereon and may be stacked as they leave the slitter rolls. When the signatures as delivered by the slitter rolls are to be stacked without any further action thereon, such as folding, it is necessary that the sheets or signatures be in overlapping relation along their ends so that such signatures will not be inserted one within the other as they pass from the slitter rolls onto the stacker. If, however, a further folding of the sheets or signatures which are delivered by the slitter rolls is necessary, the sheets should occupy positions adjacent one another rather than in overlapping relation along their edges, as is necessary when the sheets or signatures are to be stacked.

It will therefore be seen that in order for a sheet delivery mechanism to be readily adaptable to the various forms of work which it is called upon to handle, that such sheet delivery mechanism be able to accomplish any one of the aforenamed ends, automatically, positively and without the necessity of a material alteration in the structure thereof so as to be adaptable to change from one type of work to another without any appreciable loss of time.

When the signatures which are delivered by the slitter rolls after the folding operation, are to be again folded, it is desirable from the standpoint of compactness of the mechanism, as well as the efficient operation thereof, that such signatures be delivered from the conveyor laterally thereof and in single file. It is also desirable that the cross feed mechanism by which the lateral delivery of the folded signatures is accomplished be adaptable to be detached from the machine so as not to interfere with the stacking operation should the nature of the work require the signatures to be stacked immediately upon their discharge from the folding rolls.

It is the object of my invention to provide an improved sheet delivery mechanism by means of which the above desirable ends may readily be attained. Other objects of my invention will appear as the following description thereof proceeds.

In order to more clearly understand my invention, reference may be had to the accompanying drawings which illustrate several embodiments of said invention and wherein like reference characters designate like parts throughout the several views.

In said drawings:—

Fig. 1 is a fragmentary view of a signature folding machine equipped with delivery mechanism constituting one embodiment of my invention; Fig. 2 is a plan view of a sheet delivery mechanism constituting another embodiment of said invention; Fig. 3 is an enlarged diagrammatic side elevation, partly in section, of a portion of the web or belt and cross feed mechanism illustrated in Fig. 1; Fig. 4 is a fragmentary end view, with parts omitted, of the mechanism illustrated in Fig. 3; Fig. 5 is an enlarged detail side view, partly in section, of a cross feed mechanism constituting another embodiment of my invention; Fig. 6 is an enlarged side elevation of the web or belt driving mechanism illustrated in Fig. 2; Fig. 7 is a fragmentary top plan view, partly in section, of the mechanism shown in Fig. 6; Fig. 8 is an enlarged fragmentary vertical longitudinal sectional view of a sheet delivery mechanism including cross feed mechanism such as shown in Fig. 5; Fig. 9 is an end view, with parts broken away, of the cross-feed mechanism and associated devices shown in Fig. 8; Fig. 10 is an enlarged fragmentary vertical longitudinal sectional view of the sheet delivery mechanism shown in Fig. 2; Fig. 11 is a side elevation, with parts broken away, of a sheet delivery mechanism and driving means therefor constituting another embodiment of my invention; and Fig. 12 is a fragmentary top plan view of the mechanism and means shown in Fig. 11.

Referring to the drawings, and more particularly to Fig. 1, the folding mechanism there shown is of the well known type in which the feed table 1 has a plurality of diagonally disposed feed rollers 2 adapted to feed the sheets or signatures to be acted upon one after another against the guide 3 and into the folding rollers 4 and 5. The feed table with its associated rollers and the folding rolls are constructed, arranged and operated

in a manner well known to those acquainted with the art, so that no further description thereof is deemed necessary. Positioned adjacent the folding rolls 4 and 5 are delivery rolls 6 and 7, which carry the slitters 8, and are respectively mounted upon the shafts 9 and 10. The shafts 9 and 10 are suitably journaled in brackets 11' on the side frame members 11 and 12 and receive their rotation from a suitable source of power, not shown.

The shaft 9, as more clearly shown in Fig. 4, which is the shaft by which the delivery and slitter rolls and associated mechanism are driven, has rigidly secured thereto the gear 13 by means of the set screw 14 passing through the hub 15 and engaging the shaft 9. The shaft 10 has a terminal portion 16 extending beyond the side frame member 11, which terminal portion has rigidly secured thereto the gear 17. The shaft 10 slidably supports the gear 18 which, by loosening the screw 18' (Figs. 4 and 7) extending through its hub, may be moved axially of said shaft and still remain in mesh with the gear 13 on the shaft 9 as such gear 18 is moved for a substantial distance coaxially with the shaft 10 and then secured together by tightening said screw.

The side frame members 11 and 12 also revolubly support spaced parallel shafts 19 and 20 which respectively carry the rollers 21 and 22 and which have respectively rigidly secured thereto the gears 23 and 24'. Surrounding the rollers 21 and 22 is an endless web or belt 24 which is of the proper length to form an endless sheet or signature conveyor. Positioned adjacent the gear 24' and intermeshing therewith is a gear 25 mounted on the shaft 26, which is supported by the bracket members 27 removably attached as by machine screws 27', to the ends of the frames 11, 12 as clearly shown in Figs. 8 and 9 of the drawings. The gear 25 in turn intermeshes with the gear 28, which is rigidly mounted on the shaft 29 which extends transversely of the delivery end of the web or belt 24 and which is suitably journaled in the end bracket members 27. The shaft 29 has rigidly secured thereto a plurality of driving gears 30 which are adapted to intermesh with pinions 31 carried by the shafts 32, on which are mounted the rollers 33. The rollers 33 have their terminal portions beveled substantially as shown at 34 in Fig. 5, and may have circumferential grooves 35 (Fig. 3) formed therein, which grooves are adapted to coact with the loosely mounted revoluble elements 36. The shafts 32 which support the rollers 33 may be suitably journaled in the bearing bosses 37 carried by the transverse supporting member 38 that is secured, as by machine screws 38', to the bracket members 27 on the tops thereof (Figs. 8 and 9). Positioned adjacent the delivery end of the web or belt 24, and mounted on the transverse supporting member 38, is a guide and stop member consisting of a substantially horizontal element 39 which, as clearly shown in Figs. 8 and 9, has riveted or otherwise suitably secured thereto, extensions or lugs 39^a that are secured, as by machine screws 39^b, to lugs or bosses 39^c formed on said transverse supporting member 38. The member 39, at its forward end, is formed into a guide 40 which slightly overlies the delivery end of the web or belt 24. The member 39 has a depending member 41 united therewith which serves as a stop and guide for the sheets or signatures as they are fed off the web or belt 24 laterally thereof by the cross feed mechanism comprising the rollers 33. The stop and guide 41 has in turn united therewith a horizontally disposed member 42 which has its forward end 43 formed into a guide for the sheets or signatures. The horizontally disposed member 39 has apertures 44 which, in the embodiment of the invention shown in Figs. 5, 8 and 9, are bounded by the struck-up elements 45 adapted to secure the revoluble elements 36' therein. The elements 36' are preferably in the form of ellipsoids, revolubly supported by the member 39, and presenting suitable contacting surfaces to the grooves 35' (Fig. 5) formed therefor in the rollers 33.

As more clearly shown in Figs. 6 and 7, the shaft 20, on which the rear web-carrying roller 22 is mounted, passes outwardly through one of the end bearings 20', and secured on the projecting end of said shaft is a ratchet wheel 46. The projecting end of shaft 20 has revolubly mounted thereon a lever 47. The lever 47 carries at one end thereof a detent or pawl 48, which is pivoted to said lever by means of a stud or pin 49. The opposite end of the lever 47 oscillatorily supports and is pivotally connected with, the connecting rod 50 by means of a stud or pin 51. The side frame member 11 has removably secured thereto a bracket 52 by means of the screws 53, which bracket supports a stud 54 that is secured to said bracket by means of a nut 55. The stud 54 has revolubly mounted thereon a gear wheel 56 which intermeshes and is in driving communication with the pinion 17. The gear wheel 56 has eccentrically mounted thereon a pin 57, which revolubly supports the connecting rod 50 on, and pivotally connects it with, said gear wheel. The side frame members 11 and 12 may, when the cross feed mechanism is removed, have removably secured thereto a stacker pan 58 (Figs. 2 and 10) for the purpose hereinafter described.

When the signatures are to be delivered onto the movable table in overlapping relation, the web or belt 24 may be moved continuously at a relatively low speed, which slow continuous motion may be accomplished by extending the shaft 19 through its bearing on the side frame member 11 and then securing to such extended portion of the shaft 19 a gear similar to gear 56, which will be larger than the gear 23 and which will mesh with the gear 17' (Fig. 12), which is relatively smaller than the gear 18. Accordingly, in the embodiment of the invention shown in Figs. 11 and 12, the shaft 19 extends outwardly through its bearing on the side frame member 11 and carries exteriorly thereof a gear 56' which meshes with the gear 17' on shaft 10 and is secured to said shaft 19 by a screw 56''. In this case, the link 50 is pivotally connected with the gear 56' on the outer side thereof by a pin 57', and outward displacement of gear 56' from shaft 19 is prevented by a washer 54' and a screw 55' countersunk and secured in said gear and said shaft respectively so as not to interfere with motion of link 50 during operation of the same. In order to drive the web or belt 24 with a slow continuous motion by the embodiment of the invention shown in Figs. 11 and 12, the pawl 48 is first thrown back to the inoperative position thereof shown in dotted lines in Fig. 11 where the pin 48' on said pawl engages the lever 47 and prevents riding of the pawl on the ratchet 46. By then moving the gear 18 to the dotted line position as shown in Figs. 4 and 12 and wherein said gear will still remain in mesh with the gear 13, the slow continuous motion of the web or belt 24 will be produced as the shaft 9 rotates.

The operation of the device will now briefly be explained. The sheets or signatures which are

to be acted upon are fed to the mechanism by means of the rolls 2 which feed the sheets or signatures to the folding rolls 4 and 5 and associated folding plates (not shown), by which they are suitably folded. As the signatures leave the folding rolls 4 and 5 they are caused to pass through the delivery and slitter rolls 6 and 7, by means of which the signatures are cut, if so desired, to the desired size. After leaving the delivery and slitter rolls 6 and 7 the signatures pass on to the web 24 to be either stacked or further folded, depending upon the type of finished product desired. Assuming that the sheets are to be further acted upon, a continuous motion of the web 24 at a relatively high speed is desirable so that the sheets or signatures lying thereon will occupy adjacent positions rather than overlapping positions. In the embodiment of the invention shown in Figs. 1, 6 and 7, this continuous high speed motion of the web or belt 24 is obtained by shifting the gear 18 to the full line position thereof shown in Figs. 4 and 7, and turning the pawl 48 to an inoperative position or removing said pawl, the lever 47, the link 50, the gear 56, and the bracket 52, from the machine.

In the embodiment of the invention shown in Figs. 11 and 12, the continuous high speed motion of the web or belt 24 is obtained by shifting the gear 18 to the full line position thereof shown in Fig. 4, removing the set screw 56'' so that the gear 56' revolves loosely on shaft 19, and throwing the pawl 48 back to its inoperative position illustrated in dotted lines in Fig. 11. In order to prevent the corner of the sheets on the movable web from turning under when delivered laterally from the web or belt 24, a plate 59 (Fig. 1) is positioned along one side thereof, this side being the one toward which the sheets have been passed to the folding mechanism 4, 5 by the angularly extending rollers 2. When the sheets or signatures on the movable web are to be further acted upon in the machine, the web or belt 24 is driven at high speed as above described, and the cross feed mechanism illustrated in Figs. 1 and 3 or 5, 8 and 9 is secured on the frames 11, 12 at the delivery end of the movable web or belt 24.

As the leading ends of the folded sheets leave the delivery end of the movable web or belt 24 they are guided by means of the members 40 and 43 between the revoluble elements 36 or 36' and the rollers 33. When the revoluble elements 36' are idling, that is, driven by the rollers 33 without a sheet interposed therebetween, the plane of rotation of the members 36' will be at a substantial angle with the stop and guide 41. As the folded signatures are engaged by the elements 36' and the rollers 33 this angle of the plane of rotation will cause the signatures to be forced against the stop and guide 41. When the signatures have been forced against the stop and guide 41, the elements 36' will each rotate slightly about a vertical axis, as shown in Fig. 5, until the planes of rotation thereof will be substantially parallel with the stop and guide 41 and the rotation of the rollers 33 will then pass the sheets or signatures, which are in side by side arrangement on the web or belt 24, therefrom in single file arrangement and onto a mechanism which further acts upon these sheets, which mechanism in Fig. 1 is shown to consist of further folding rolls 60 and 61, from which the sheets or signatures are discharged onto a movable web or belt 62 and, through mechanism similar to the type illustrated in Fig. 3, are discharged in single file onto the stacker or like receiving member 63. It will be understood that the action of the rollers 33 and the elements 36 in feeding the sheets or signatures to the folding rolls 60, 61 are substantially the same as that of the rollers 33 and members 36', that the folding rolls 60 and 61 may have delivery and slitter rolls similar to rolls 6 and 7 positioned adjacent thereto, and that the stacker element 63 may be replaced by a further folding or like operating mechanism.

When the sheets, as they leave the delivery and slitter rolls 6 and 7, are in their completed form, that is, require no further action thereon, the mechanism adjacent the delivery end of the movable web or belt 24, as illustrated in Figs. 1 and 3 or 8 and 9, will be removed therefrom by removing the screws 27' and a stacker table 58, as shown in Figs. 2, 6 and 10, will be positioned in place thereof. This stacker pan or table 58 is riveted or otherwise suitably secured on brackets 58' which may be removably secured, as by screws 58'', to the frames 11, 12 at the forward ends thereof, as shown in Fig. 10 of the drawings. When the sheets are to be stacked on the movable web or belt 24, as before explained, it will be necessary that means be provided for producing the intermittent or relatively slow motion of the web or belt 24 to enable the signatures placed thereon to occupy overlapping relation along their adjacent ends to prevent an interleafing of the signatures as they are stacked. The relatively slow and continuous stacking motion of the movable web or belt 24 to accomplish the above results may, in the embodiment of the invention shown in Figs. 11 and 12, be effected by the engagement of the gears 56' and 17' of different sizes on the shafts 10 and 19, and disengagement of pawl 48 from ratchet 46, as before explained. To produce intermittent stacking motion of the web or table 24 by the last mentioned embodiment of the invention, gear 18 is moved to the dotted line position thereof shown in Fig. 4, the set screw 56'' (Fig. 12) is removed, and the pawl 48 is thrown over into the full line position thereof shown in Fig. 11. To produce the intermittent stacking motion of the movable web or belt 24 by the embodiment of the invention illustrated in Figs. 6 and 7 said embodiment is positioned on the frame member 11 and the rotation of the gear wheel 56 will, through the connecting rod 50 and the pawl 48, cause a step-by-step rotation of the web bearing roller 22 and accomplish the desired results. When driving communication to the web 24 is established by means of the ratchet and pawl attachment of the last mentioned embodiment of the invention, the gear 18 is moved axially of the shaft 10 into the dotted line position shown on Fig. 7. This permits gear 23 to turn independently of the shaft 10 which is necessary for the intermittent movement of the web or belt 24.

It will be noted that either the belt driving mechanism illustrated in Figs. 6 and 7 or the stacking and cross feed mechanisms illustrated in Figs. 1 to 3, inclusive, and 8 to 10, inclusive, are readily removable from the machine to adapt the sheet delivery mechanism to accomplish any one of a plurality of desirable ends without interrupting the operation thereof for a material length of time. It will further be noted that the belt driving mechanism shown in Figs. 11 and 12 affords high and low speed continuous movement of the web or belt 24 for feeding and stacking purposes respectively, as well as intermittent movement of said web or belt for stacking pur-

poses, and that these movements may be selectively produced without having to remove any of the web or belt driving elements from the machine. It will also be noted that the arrangement of the members as illustrated in Fig. 1 may be carried out through any desired number of steps so that the finished folder may have any number of folds and the sheet delivery mechanism still be adaptable to omit any of the steps as a change in the type of work to be produced is found necessary. Several embodiments of my invention are herein described and illustrated with more or less particularity, but it is to be expressly understood that said invention is not limited to said embodiments or otherwise than by the terms of the appended claims.

I therefore particularly point out and distinctly claim as my invention:—

1. In a sheet delivery mechanism, the combination with a traveling belt, of means for supplying sheets thereto, a transversely extending stop adjacent one end of said belt, a guide for said sheets carried by said stop, rollers extending substantially longitudinally of said belt and positioned adjacent said stop, and ellipsoidal means carried by said guide adapted to coact with said rollers to receive said sheets and deliver the same laterally of said belt in single file.

2. In a sheet delivery mechanism, the combination with a traveling belt, of means for supplying sheets thereto in side by side arrangement, a transversely extending stop adjacent one end of said belt, a roller positioned intermediate said belt and said stop, a guide for said sheets carried by said stop and overlying a portion of said belt, and revoluble means carried by said guide and adapted to coact with said roller to receive said sheets and discharge the same laterally of said belt in single file.

3. In a sheet delivery mechanism, the combination with a traveling web or belt, of means for supplying sheets or signatures thereto in side by side arrangement, a stop extending transversely of said web or belt adjacent one end thereof, a guide for said sheets carried by said stop and overlying a portion of said web or belt, rollers extending substantially longitudinally of said web or belt and positioned intermediate the delivery end thereof and said stop, and balls carried by said guide, circumferential deformations being formed on said rollers and adapted to coact with said balls to receive said sheets therebetween and deliver the same laterally of said web or belt in single file.

4. In a sheet delivery mechanism, the combination with a traveling belt, plural rolls for cutting sheets and supplying the same on said belt in side by side arrangement, means associated with said rolls and said belt for selectively establishing continuous driving communication therebetween, and means associated with said rolls and said belt for establishing intermittent driving communication therebetween.

5. In a sheet delivery mechanism, the combination with a traveling belt, of rolls for supplying sheets to said belt in side by side arrangement, means for driving the belt from one of said rolls at a relatively high speed, and means for driving the belt from one of said rolls at a relatively low speed.

6. In a sheet delivery mechanism, the combination with a traveling conveyor, comprising an endless web and plural rollers; rollers for delivering sheets to said web; disengageable means for establishing driving communication between one of said last named rollers and one of said conveyor rollers; and disengageable means for establishing intermittent driving communication between one of said delivery rollers and one of said conveyor rollers.

7. In a sheet delivery mechanism, the combination of spaced parallel rollers; an endless web passing around said rollers; feed rollers for supplying sheets to said web, said feed rollers carrying disks for cutting said sheets; revolubly supported means; a movable gear coaxially mounted on one of said feed rollers and adapted to effect driving communication between the latter and one of said web rollers; means mounted coaxially with one of said feed rollers and adapted to effect driving communication between the latter and said revolubly supported means, a connecting rod revolubly and eccentrically supported at one end by the revolubly supported means; a pivotally supported member connected with the other end of said connecting rod, a pawl carried by said pivotally supported member, and a ratchet associated with one of said web rollers and adapted to coact with said pawl.

8. In a sheet-delivery mechanism, the combination with a traveling belt, cutter bearing means for supplying sheets to said belt in side by side relation, detachable means associated with said belt for delivering said sheets therefrom in single file arrangement, and means adapted to be removably secured in position at one side of said belt for association with said sheet supplying means and for imparting to said belt intermittent traveling movement.

9. In a sheet delivery mechanism, the combination with a traveling conveyor; of means for supplying sheets thereto; means for imparting continuous motion to said conveyor; a stop arranged transversely of said conveyor at the delivery end thereof, and rollers associated with said stop for receiving said sheets adapted to rotate in a plane at an angle to said stop until said sheets strike said stop and then to rotate in a plane parallel to said stop to deliver said sheets laterally from said conveyor.

10. In a sheet delivery mechanism, the combination with a traveling belt, of means for supplying sheets thereto, a roller extending substantially longitudinally of said belt adjacent the forward end thereof, and means adapted to coact with said roller for receiving the forward edges of said sheets from said belt and discharging the same laterally thereof in single file, said roller and coacting means being removable from their operative positions adjacent said belt.

11. In a sheet delivery mechanism, the combination with a traveling belt, of means for supplying sheets thereto, a transversely extending stop for said sheets adjacent one end of said belt, a plurality of rollers distributed transversely of the belt along said stop and each mounted at only one end and extending substantially longitudinally of said belt, and rotatable elements adapted to coact with said longitudinally extending rollers to receive the forward edges of said sheets from said belt and discharge the sheets laterally thereof in single file.

12. In a sheet delivery mechanism including a traveling belt, means for supplying sheets thereto in side-by-side arrangement, and means for delivering said sheets laterally of said belt in single file, the combination of a plate extending longitudinally of said belt along one side thereof and over which the sheets are delivered laterally therefrom, a stop for said sheets adjacent said second

named means and the delivery end of said belt, and means adjacent said plate for folding said laterally delivered sheets.

13. In a paper handling machine, a conveyor belt for feeding sheets, removable means located adjacent the belt for changing the direction of movement of said sheets, and means for driving said belt at high speed or low speed selectively, whereby said belt may serve as a stacker when said first named means is removed and said slow speed driving means is employed.

14. In combination, a pair of spaced parallel rollers, a conveyor belt running over said rollers, one of said rollers having a shaft, a change speed driving mechanism associated with said shaft for driving the same at high speed or low speed selectively, and cross guiding means adapted to be removably positioned adjacent said belt.

15. In combination, a pair of spaced parallel rollers, a conveyor belt running over said rollers, one of said rollers having a shaft, a change speed driving mechanism associated with said shaft and adapted to impart continuous motion to the latter and the belt at high speed or low speed respectively, means for moving sheets off said belt horizontally and transversely to the direction of movement of the belt, and means for disabling said last named means.

16. In a machine of the class described, a web or belt, means for driving said web or belt, a cross-feed roller mounted adjacent the web or belt and adapted to move sheets transversely to the direction of movement of said web or belt, and means associated with said web or belt for driving said roller.

17. In a paper handling machine, a conveyor, mechanism for selectively operating the conveyor continuously or intermittently, and cross feed means associated with the conveyor and including a sheet guide adapted for removal to enable stacking of sheets by said conveyor when it is operated intermittently.

18. In a paper handling machine, sheet handling means, cross feed means associated with the sheet handling means for moving the sheets thereover transversely to their direction of delivery thereon, means for disabling said cross feed means, and means for selectively imparting sheet feeding or sheet stacking motion to said sheet handling means.

19. In apparatus of the character described, a conveyor, a sheet stop and guide extending transversely of said conveyor and toward which the sheets are fed thereon, and a plurality of cooperatively associated means for feeding sheets along said stop and guide, one of said means comprising an ellipsoid adapted to rotate in a plane at an angle to the stop and guide or in a plane parallel therewith.

20. In apparatus of the character described, a sheet guide, and a plurality of cooperatively associated means for feeding sheets along said guide, one of said means comprising an ellipsoid adapted to rotate in a plane at an angle to the guide or in a plane parallel therewith.

21. In apparatus of the character described, a conveyor, a sheet stop and guide extending transversely of said conveyor and toward which the sheets are fed thereon, and a plurality of cooperatively associated means for feeding the sheets along said stop and guide, one of said means comprising one or more rotatably mounted ellipsoids.

22. In apparatus of the character described, a sheet guide, a plurality of driven rollers extending along the guide diagonally thereof, and ellipsoids rotatably associated with said rollers and mounted for turning movement in openings in the guide.

23. In apparatus of the character described, a sheet guide, a plurality of driven rollers extending transversely of said guide, and a plurality of ellipsoids associated with said rollers and rotatably mounted in the guide.

24. In apparatus of the character described, a sheet guide, and means for feeding sheets therealong comprising a driven roller and an ellipsoid rotatably associated therewith.

25. In apparatus of the character described, a sheet guide, and a plurality of cooperatively associated means for feeding sheets along said guide, one of said means comprising a rotatably mounted ellipsoid.

26. In apparatus of the character described, the combination with a conveyor, of means for cutting sheets and delivering them to said conveyor, means associated with said cutting and delivering means and the conveyor for selectively establishing continuous driving communication therebetween, and means associated with the cutting and delivering means and the conveyor for establishing intermittent driving communication therebetween.

27. In apparatus of the character described, the combination with a conveyor, of means for delivering sheets thereto, means associated with the sheet delivering means and the conveyor for establishing intermittent driving communication therebetween, and means associated with said sheet delivering means and said conveyor for selectively establishing continuous driving communication therebetween at different speeds.

28. In apparatus of the character described, the combination with a conveyor, of means for selectively driving said conveyor intermittently, or continuously at low speed, whereby it may function as a stacker, and means for driving the conveyor continuously at high speed whereby it may deliver sheets rapidly to other means.

29. In apparatus of the character described, a conveyor, a removably mounted cross feed mechanism toward which sheets may be fed by the conveyor and adapted to feed said sheets laterally thereof, means for driving the conveyor continuously at high speed to deliver the sheets to said cross feed mechanism, and means for driving said conveyor intermittently, or continuously at low speed, upon removal of the cross feed mechanism, whereby the conveyor may function as a sheet stacker.

30. In apparatus of the character described, sheet feeding means, change speed gear mechanism adapted to drive the sheet feeding means continuously at one speed for feeding purposes or continuously at another speed for stacking purposes, and pawl and ratchet mechanism adapted to drive the conveyor intermittently for stacking purposes.

31. In apparatus of the character described, sheet feeding means, high and low speed gear mechanisms associated with the sheet feeding means and each adapted to drive the same continuously, pawl and ratchet mechanism associated with the sheet feeding means and adapted to drive the same intermittently, a driven shaft, and means for interchangeably connecting said mechanisms with said shaft.

32. In apparatus of the character described, a conveyor for selectively feeding or stacking sheets, means adapted to drive said conveyor con-

tinuously at high speed for feeding purposes or continuously at low speed for stacking purposes, and means adapted to drive said conveyor intermittently for stacking purposes.

33. In a paper handling machine, a conveyor, means for operating said conveyor continuously whereby it may feed sheets in rapid succession, and means for operating said conveyor intermittently whereby it may function as a sheet stacker.

34. In a paper handling machine, a conveyor, mechanism for imparting sheet feeding motion to the conveyor to feed sheets in rapid succession, removable means associated with the conveyor for changing the direction of movement of said sheets, and mechanism for imparting sheet stacking motion to the conveyor whereby it may function as a stacker upon removal of said means.

35. In a paper handling machine, a conveyor, disconnectible mechanism for operating the conveyor continuously, and cross feed means associated with the conveyor and including a sheet guide adapted for removal to enable stacking of sheets by said conveyor when said mechanism is disconnected.

36. In a paper handling machine, a conveyor, mechanism for selectively operating said conveyor at high or low speed, and cross feed means associated with the conveyor including a sheet guide adapted for removal to enable stacking of sheets by said conveyor when it is operated at low speed.

37. In a machine of the class described, a sheet conveyor, mechanism for operating the conveyor either at sheet feeding speed or at sheet stacking speed selectively, cross feeding means associated with the conveyor, and cross guiding means adapted to be removably positioned adjacent the conveyor.

38. In a machine of the class described, a sheet conveyor, mechanism for operating the conveyor either at sheet feeding speed or at sheet stacking speed selectively, means for moving sheets off said conveyor in a lateral direction transverse to the direction of movement imparted thereto by the conveyor, and means for disabling said last named means.

39. In combination, a sheet conveyor, gearing adapted to drive said conveyor continuously at high speed, ratchet mechanism adapted to drive said conveyor intermittently, means for selectively connecting said gearing or ratchet mechanism to the conveyor, and a sheet guiding means adapted to be removably positioned adjacent the conveyor transversely to the direction of movement imparted to sheets by said conveyor.

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