

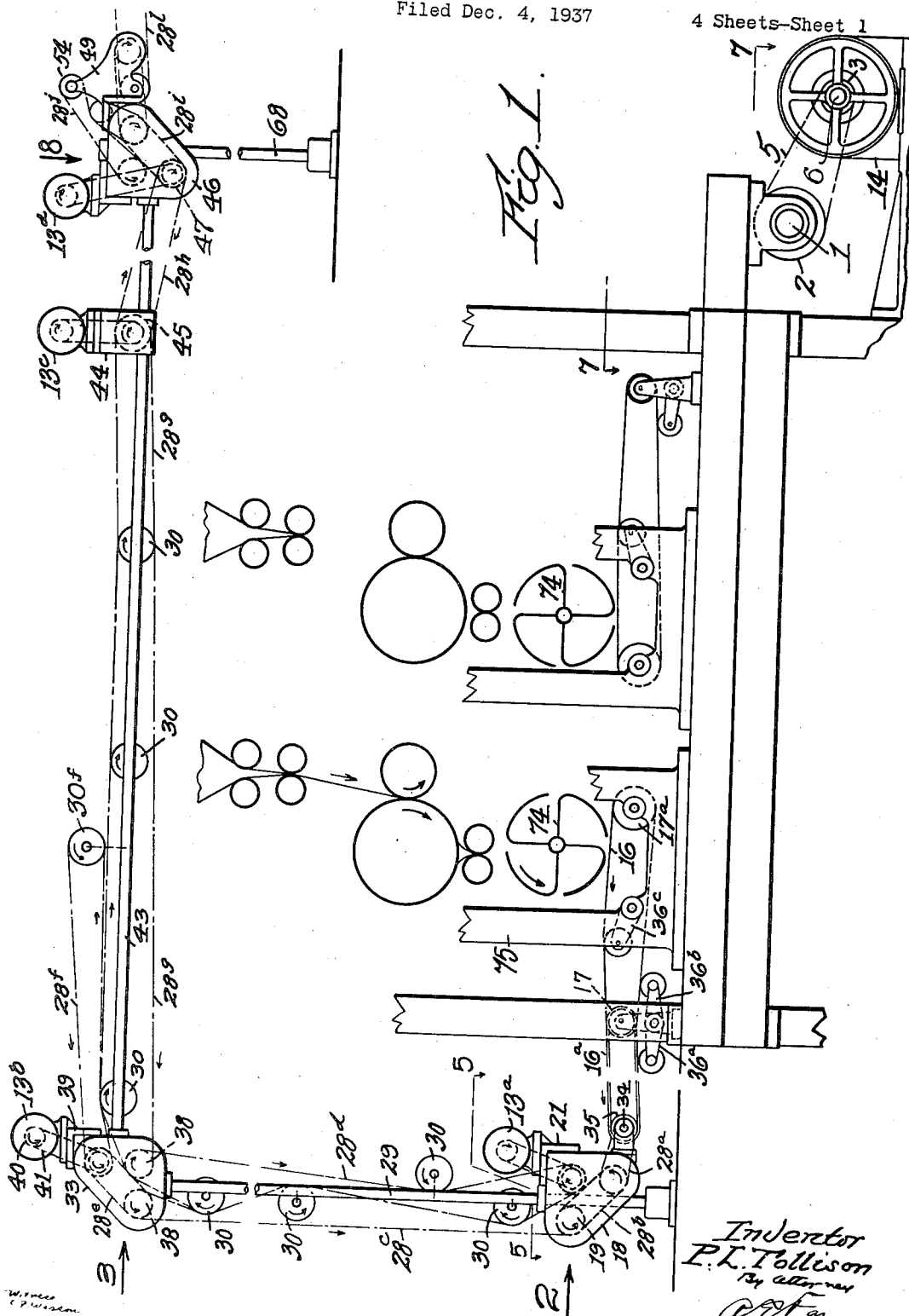
April 16, 1940.

P. L. TOLLISON
PRINTING PRESS CONVEYER

2,197,573

Filed Dec. 4, 1937

4 Sheets-Sheet 1



April 16, 1940.

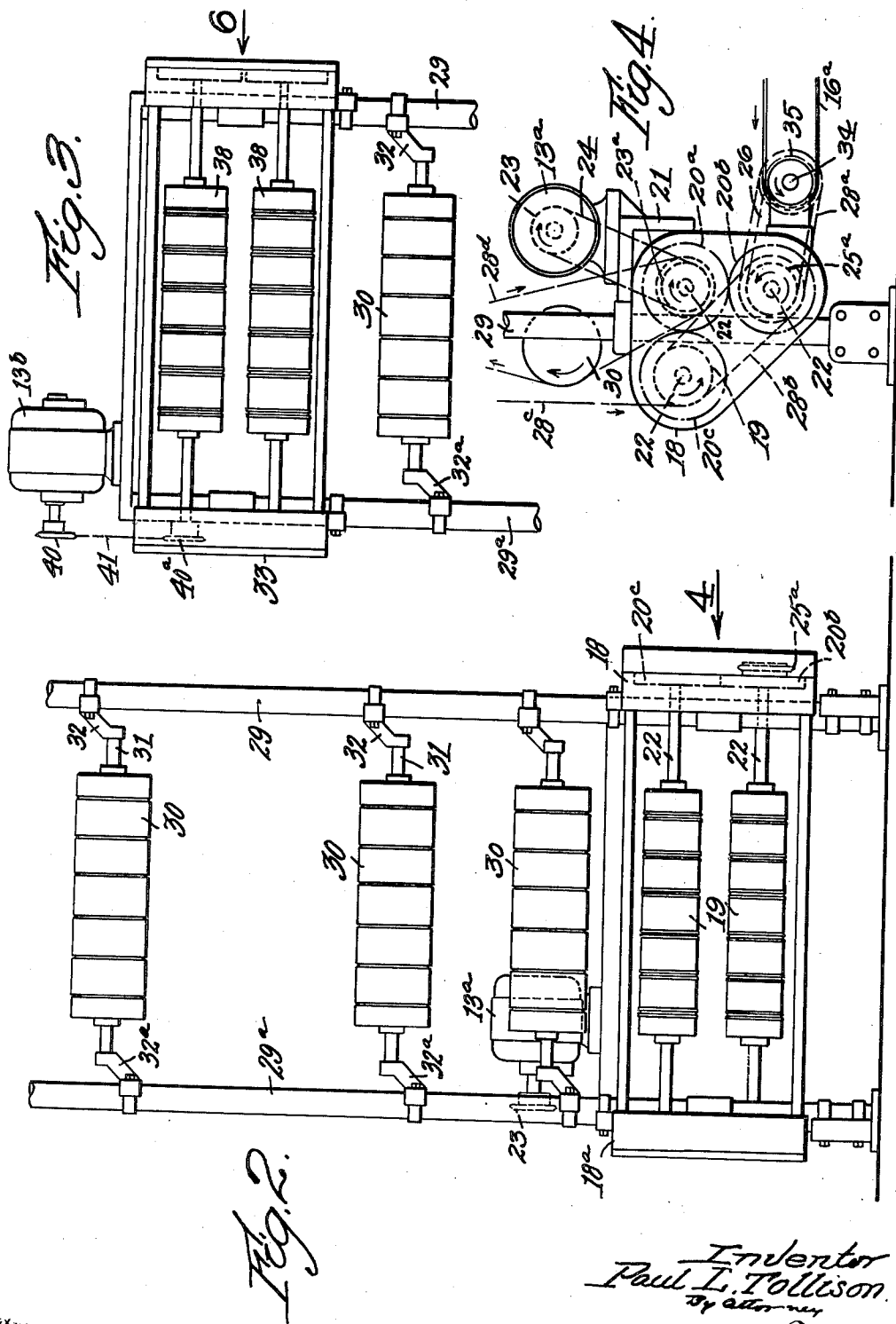
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4 Sheets-Sheet 2



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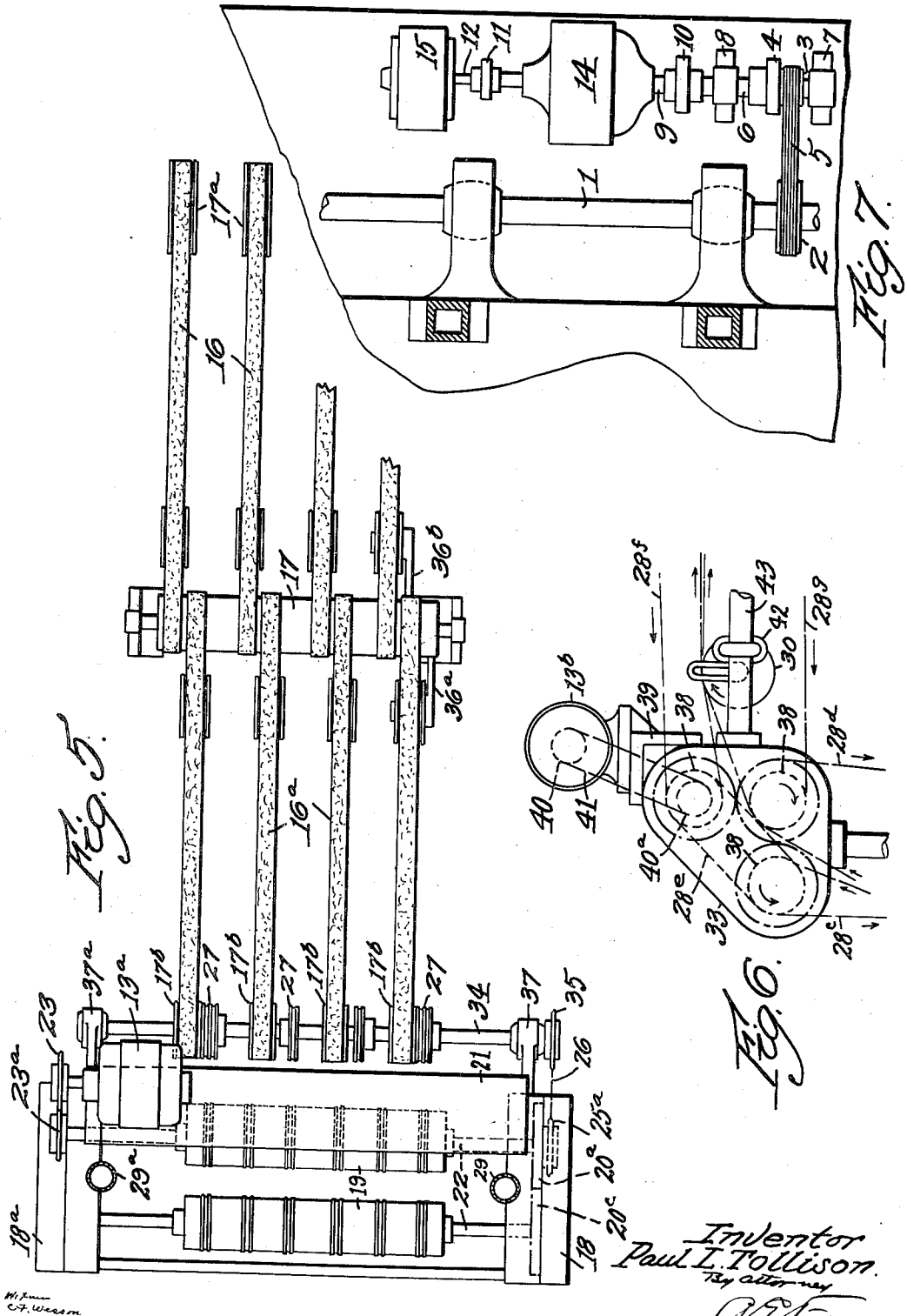
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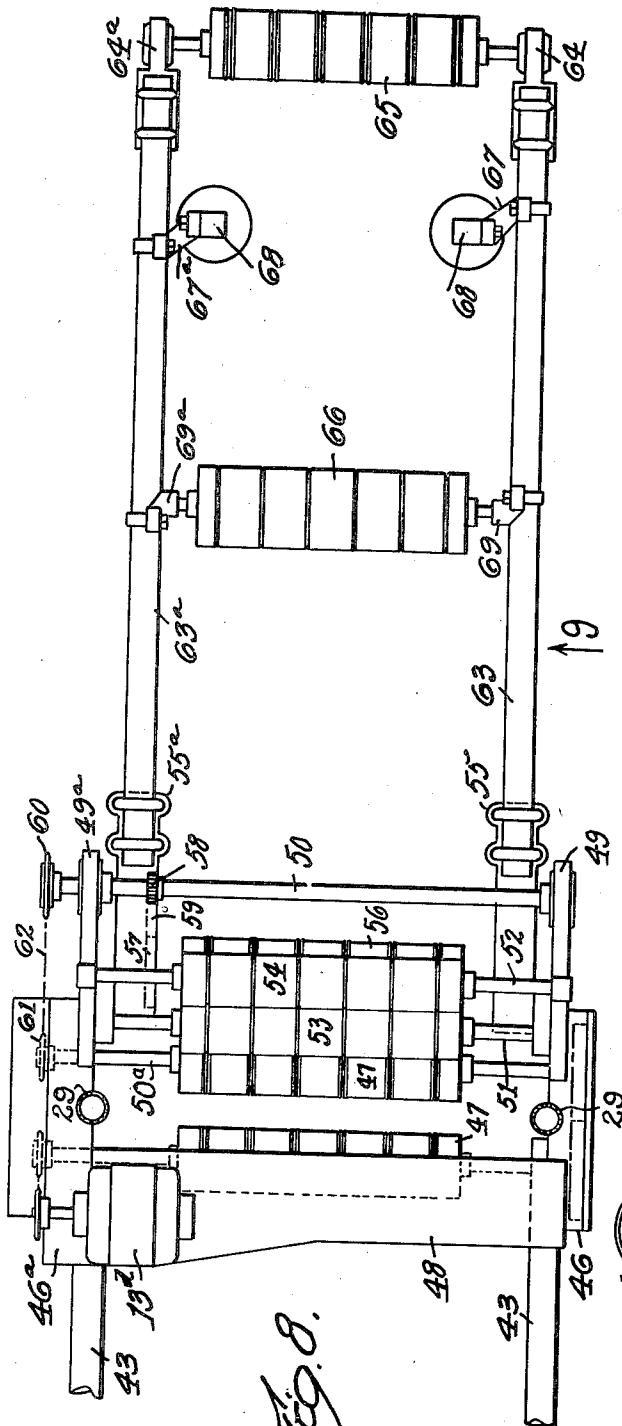


Fig. 8.

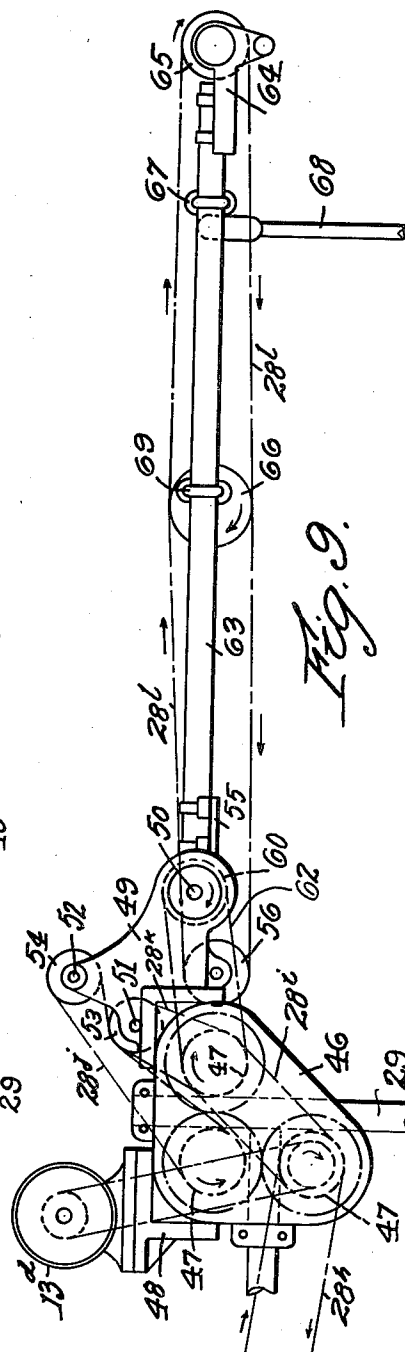


Fig. 9.

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UNITED STATES PATENT OFFICE

2,197,573

PRINTING PRESS CONVEYER

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Application December 4, 1937, Serial No. 178,076

6 Claims. (Cl. 271-76)

This invention relates to means connected with a printing press for conveying newspapers.

The principal objects of the invention are to provide a plurality of separately driven conveyer units adapted to convey the printed products, as newspapers, along lines at angles to each other so as to convey them around corners and the like; to provide for operating them synchronously so that the papers will move at the same speed in all parts of the conveying apparatus; to provide such construction in a simple and reliable form in which the several units will operate in exact synchronism with each other, depending on the speed of the press itself, thus eliminating undesirable shafting or other mechanical connections between the conveyer units; to provide a suitable connection between a press driven dynamo and with several motors, one for each unit, so that any press speed change will directly change the dynamo output, causing the conveyer speed to change in direct proportion to any change in the press speed; to provide means for transferring the papers from each conveyer unit to the next on running at the same speed as the conveyer units, and to provide means whereby the dynamo may be operated to produce power for operating the driving motors of the conveyer units independently of the printing press, when the press is not in operation.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is an end view of a printing press folder and delivery comprising a side elevation of the conveyer units which constitute the subject matter of this invention;

Fig. 2 is an end view of the same, taken in the direction of the arrow 2 in Fig. 1;

Fig. 3 is an end view of the upper part of the same end, taken at a point indicated by the arrow 3 in Fig. 1;

Fig. 4 is an enlarged view similar to Fig. 1 of the lower left hand corner of that figure, showing the way in which the newspapers are conveyed in one direction by one unit and in another direction at right angles thereto of another unit and transferred from one to the other;

Fig. 5 is a horizontal sectional view on the line 5-5 of Fig. 1;

Fig. 6 is a view similar to Fig. 4, showing the upper left hand corner of Fig. 1;

Fig. 7 is a sectional view on the line 7-7 of

Fig. 1, showing the introduction of power into this construction;

Fig. 8 is a plan of the top horizontal unit of this machine, and

Fig. 9 is a front elevation of the same, as indicated by the arrow 9 in Fig. 8.

In the form shown, newspapers, or other printing press products, are received from the folder on a conveyer 16, which is horizontal, delivered through a corner of the device to a vertical conveying unit, delivered through another corner to a top horizontal conveying unit and from there delivered through what may be considered the fourth corner, to the delivery.

The power for operating these units of the conveyer is delivered from the printing press through a main drive shaft 1. As this shaft is connected with the printing press and driven by it, obviously it rotates at a speed proportional to the web speed at all times. On this shaft is carried a sprocket 2 connected to a sprocket 3 on an overrunning clutch 4 through a chain 5. The overrunning clutch 4 is keyed to a shaft 6 and that is supported in pillow blocks 7 and 8. A generator 14 is shown, the armature shaft 9 of which is secured to one end of the shaft 6 by a coupling 10. At the opposite end of the shaft 9 it is connected to the shaft 12 of a motor 15 by a coupling 11.

The rotation of the main shaft 1 in one direction will cause the overrunning clutch 4 to run the generator 14 for supplying a current. By means, such as shown in United States Patent 1,993,579, the current is supplied to provide a uniform synchronous operation of several A. C. synchronous motors 13^a, 13^b, 13^c and 13^d. Each one of these motors is connected with one of the units of the conveyer and operates that unit separately but in synchronism with all the others.

In the normal operation the rotor of the motor 15 will rotate but will not have any effect for the reason that the motor line switch must be opened at this time. This motor 15 is used so that when the press is idle, the motor line switch may be closed, causing the motor to drive the generator 14 with the same effect, except that the production of speed proportionate to the speed of the press is not present, as has been before described. The overrunning clutch 4 automatically disengages itself from the sprocket 3 and shaft 1 when the clutch is run by the motor 15 and causes the main shaft 6 to run a few turns in the opposite direction. This operation is used when it is desired to clear the conveyer of papers when the press stops.

The invention is shown in connection with two sets of fan delivery blades 74 of the folder unit 75 to deposit the folded newspapers upon a set of delivery belts 16. Only one of these halves of the folder unit will be further described. The belts 16 carry the newspaper to a set of belts 16^a and out at the first bend of the complete conveyer or lower left end corner, as it has been called, to endless wire loops 28^a and 28^b. The belts 16 and 16^a are supported by rollers 17 and pulleys 17^a and 17^b. Belt tighteners 36^a, 36^b and 36^c keep the belt under proper tension.

The pulleys 17^b are fastened to a shaft 34 which also carries sheaves 27 and has mounted on one end a sprocket 35. The shaft 34 is rotatably mounted in brackets 37 and 37^a which are fastened to two lower left hand triangular corner frames 18, on the front, and 18^a on the back. These frames 18 and 18^a rotatably mount three shafts 22 which extend the width of the folder and carry three rolls 19. Two of these sets of rolls carry the endless loops 28^b. One of them with rolls 25 carry the loops 28^a. These loops 28^a and 28^b support the papers on their upper surfaces and raise them into the vertical conveyers 28^c and 28^d. At the outer ends of the shafts 22 are mounted respectively gears 20^a, 20^b and 20^c forming a gear train. These gears are in mesh with each other so that the gear 20^a is the center of a gear train of three gears, all driven directly or indirectly from the motor 13^a. Thus these three rolls rotate simultaneously.

The motor 13^a is mounted on a bracket 21 which is in turn fastened to one of two corner frames 18 and 18^a. On the shaft of the motor 13^a is a sprocket 23 which is connected by a chain 24 to a sprocket 23^a fixed on the shaft 22 to which the gear 20^a is fixed. A sprocket 25^a, fixed on the shaft 22 of the gear 20^b and bolted to that gear, is connected by a chain 26 to a sprocket 35 on the shaft 34. This drives the belts 16^a and the belts 16 which constitute the delivery from the fans. The two rolls 19 on this shaft 22 and the shaft 22 at the left of it carry what I designate endless wire loops 28^b. These wire loops are introduced at the corners of the structure to serve as conductors for the papers from one conveyer to another in all cases. It will be seen here that the paper has to go with the wire loops 28^a and 28^b up into contact with two endless loops 28^c and 28^d which, together constitute a conveyer unit, running at an angle to the conveyer unit 16 and 16^a. The loop 28^b constitutes a means for transferring the papers from a horizontal belt or other endless conveyer into the vertical unit of the conveyer and enables the papers then to be transferred upwardly to the top of this machine.

The operation of the motor 13^a, through the chains and gear train described, causes the rollers 19 and the sheaves 27 and pulley 17^b to revolve in the same surface direction so as to carry the newspapers deposited on the belt 16 and 16^a into the first bend of the machine where they are picked up on the loops 28^a and 28^b and carried between the rollers 19 to a position between the loops 28^c and 28^d into the vertical unit. This vertical unit is not restricted to extending up but may be designed to extend down any distance, or at any other angle, depending on the type of installation. It may convey the newspapers in a plane straight path or it may involve twisting to suit construction purposes.

In the form shown the conveyer unit 28^c and

28^d extends upward in a vertical plane. This vertical unit involves side rails 29 and 29^a supporting a series of rollers 30 rotatably mounted on shafts 31. These shafts are clamped to brackets 32 and 32^a fastened on the rails 29 and 29^a and the same structure is repeated again in the upper horizontal unit 28^c of the conveyer. The vertical unit extends into an upper corner 33, which is similar to the lower corner, as far as the loops, framing, etc. is concerned but is in a position to carry the newspapers from the vertical corner, either forward or back, in other words in the required direction. In this case it is shown as directing the newspapers back over the press delivery.

The loops 28^c and 28^d are carried up through the vertical unit on alternate sides of the rolls 30 in such fashion as to hold the papers firmly between the upwardly moving strands of the loops 28^c and 28^d. These loops are carried around rolls 38 in the upper corner 33 so that the return strand of each loop will extend downwardly on the outside of the rolls 30.

In the upper corner 33 of the conveyer, the rolls and shaft are similar to those in the lower corner and are provided with similar gearing. This corner and the upper unit are operated by the motor 13^b which is mounted on a bracket 39 in the same way as in the lower corner.

The motor 13^b in operating the corner 33 is synchronized with the motor 13^a in the manner stated above so that the speed of paper feed is the same in the two corners. The motor 13^b operates this corner through sprockets 40, 40^a and chain 41. The rolls 38 and the rolls 19 carry the wire loops 28^c and 28^d, thereby equalizing any strain in this loop.

After the papers leave the loops 28^c and 28^d they pass between the rolls 38 and guided by a loop 28^e, are laid down on the upper strand of a horizontal loop 28^e. They are held down on this loop by the lower strand of a loop 28^f supported by rolls 30^f. The newspapers are carried along the horizontal unit at the top until they pass from the unit as shown. The horizontal unit is similar in construction to the vertical unit, except that the paper in most cases has no wire above it. The horizontal unit is supported by a pair of horizontal side rails 43 which carry a second series of the rolls 30 mounted as in the vertical unit.

Brackets 42 carried by the rails 43 support the two rolls 30 carrying the loop 28^f. The other rolls 30 carrying the loop 28^e are supported by the rails 43. On these rails 43 is a bracket 44 which carries a roll 45 at the end of the loop 28^e. The bracket 44 also carries a motor 13^c for operating the next unit. By means of a sprocket and chain arrangement rolls 45 are driven from the motor 13^c and support the adjacent ends of the two endless loops 28^e and 28^f. This intermediate roller overcomes any undue strain in the conveyer wire loops 28^e and 28^f, because of the long distance between driving units. Of course, this same unit driven by the motor 13^c could be installed in a vertical unit, if necessary. Of course, the motor 13^c is operated synchronously by being fed from the same source of electric power 14 as the motors 13^a, 13^b and 13^d.

Newspapers are carried from the horizontal unit into the delivery unit formed by the loop 28^h and the construction here is similar to what has been described before.

Supported in frames 46 and 46^a are rollers 74.

47 similar to the rollers 19 and 38. One of these rollers is run by a chain 69 from the motor 13^d the same as in the other cases. On the frames 46 and 46^a are brackets 48 on which the motor is mounted and also brackets 49 and 49^a rotatably supporting a shaft 50. The brackets 49 and 49^a also carry shafts 51 and 52, which rotatably carry rolls 53 and 54. As stated, the motor 13^d drives the delivery unit and helps to drive the loop 28^a. Because the motor 13^d is synchronized at the same speed as the other motors mentioned there is no change in newspaper speed up to this point. The loops 28¹, 28² and 28³ are arranged to pick up and carry the newspapers at this corner up over the roller 53 and under the roller 54. This is shown in Fig. 9 where the motor 13^d drives the loops and they are supported by the side rail 29 and lugs 68.

Mounted on the shaft 50 by means of bearings are brackets 55 and 55^a which in turn carry a roller 56. A gear 57 is keyed to the same shaft as the roller 56 and, by means of a pinion 58 keyed to the shaft 50 and an intermediate gear 59, rotates the roller 56. At the outer end of the shaft 50 is a sprocket 60 which is connected by a chain 62 to a sprocket 61 attached to a shaft 50^a located in the delivery unit and carrying the roller 47.

Brackets 55 and 55^a also carry side rails 63 and 63^a which in turn carry brackets 64 and 64^a that rotatably mount a roller 65. Also mounted on the side rails 63 and 63^a are brackets 69 and 69^a which carry a roller 66. The brackets 67 and 67^a are also mounted on the rails 63 and 63^a and carry delivery table legs 68. The wire loop 28¹ passes around the rolls 56, 66 and 65. The design of the gear 57 and the pinion 58 is such that the lineal travel of the loop 28¹ is decreased an appreciable amount over the lineal travel of any preceding wire loops, although the several motors are always working in synchronism. This action will cause the papers to pile upon the delivery table, making it easier for a man to remove a paper at this time by hand, if desired.

It will be noted that the loops on the entire conveyer are for carrying the paper only and at no time should they be considered as a driving element except insofar as turning the idler rollers is concerned. The drive for each conveyer is accomplished by a separate motor and means is provided for synchronizing these separate motors so as to synchronize the separate units of the conveyer.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a conveyer for printed products, the combination of a plurality of conveyer units, together making up the conveyer, separate motors each for operating one of the different units, a single source of power connected for operating the several motors synchronously, the units being arranged at angles to each other to convey the products and deliver them at the points at which the units terminate and with the delivery of one unit in position to deliver the products at the receiving end of the next unit, means for transferring the products from one unit to the next one at the necessary angle, and means by which the last named means is operated by one of said motors.

2. In a device for transferring newspapers

from a printing press, the combination of horizontal delivery belts in position for receiving the newspapers from the delivery of said press and transferring them away from it, a horizontal conveyer unit for transferring the papers from the said delivery belts, a conveyer end arranged vertically running endless loops at an angle to the horizontal for transferring the papers from the delivery belts to the bottom of the conveyer unit by each engaging the opposite side of the newspapers and carrying them along, and a single motor for driving the delivery belts, the conveyer unit and the loops synchronously.

3. In a means for transferring newspapers from a printing press, the combination of delivery belts for receiving the papers from a printing press delivery and transferring them therefrom, an endless conveyer unit at an angle to the delivery belts, means for taking the newspapers from the delivery belts and inserting them into the conveyer unit, a motor for operating the delivery belts, conveyer unit, and said means synchronously, a second conveyer unit at an angle to the first conveyer unit, means for taking the newspapers from the first conveyer unit and applying them to the second conveyer unit, a second motor connected to operate said last named means and the second conveyer unit synchronously, and a single means for applying power to the two motors synchronously, whereby all the conveyers and conveyer units and all the means for transferring the papers from one to the other will be operated in synchronism.

4. In a device for transferring newspapers from a printing press, the combination with delivery belts for receiving the printed papers, of endless running loops for receiving the papers from said delivery belts and changing the angle of their delivery, a first conveyer unit at a material angle to the first delivery belts having its receiving end in position to receive the newspapers from the loops and consisting of two series of endless belts, means for bringing the two series of belts close together at a point near that at which the papers are introduced into it to grip the papers and insure their movement with the delivery belts and conveyer, a motor connected to drive the first delivery belts, the first conveyer unit and the loops in synchronism, the belts of the second conveyer unit diverging at the end of said conveyer, endless running loops located and adapted to receive the papers from the first conveyer unit, a second conveyer unit in position to receive the papers from said loops, and at an angle thereto, a second motor connected for running the second set of loops and second conveyer unit in synchronism, and a single source of power for running both motors and therefore running the second conveyer unit in synchronism with the other conveyer unit.

5. In a device for transferring newspaper from a printing press, the combination with delivery belts for receiving the printed papers, of endless running loops for receiving the papers from delivery belts and changing the angle of their delivery, a conveyer unit at a material angle to the delivery belts and consisting of two series of endless belts, a motor connected to drive the delivery belts, the conveyer unit and the loops in synchronism, endless running loops located and adapted to receive the papers from the conveyer unit, a second conveyer unit in position to receive the papers from said loops, a second motor connected for running the second

set of loops and second conveyer unit in synchronism, and a single source of power for running both motors and therefore running the second conveyer unit in synchronism with the other conveyer unit.

6. The combination of a plurality of conveyer units for conveying newspapers, a motor for operating one unit, a separate motor for operat-

ing the second unit, a single source of alternating current for operating both motors synchronously, endless loops for transferring the papers from the first unit to the second, and means for operating said loops by one of said motors, whereby they will operate synchronously with the conveying units. 5

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