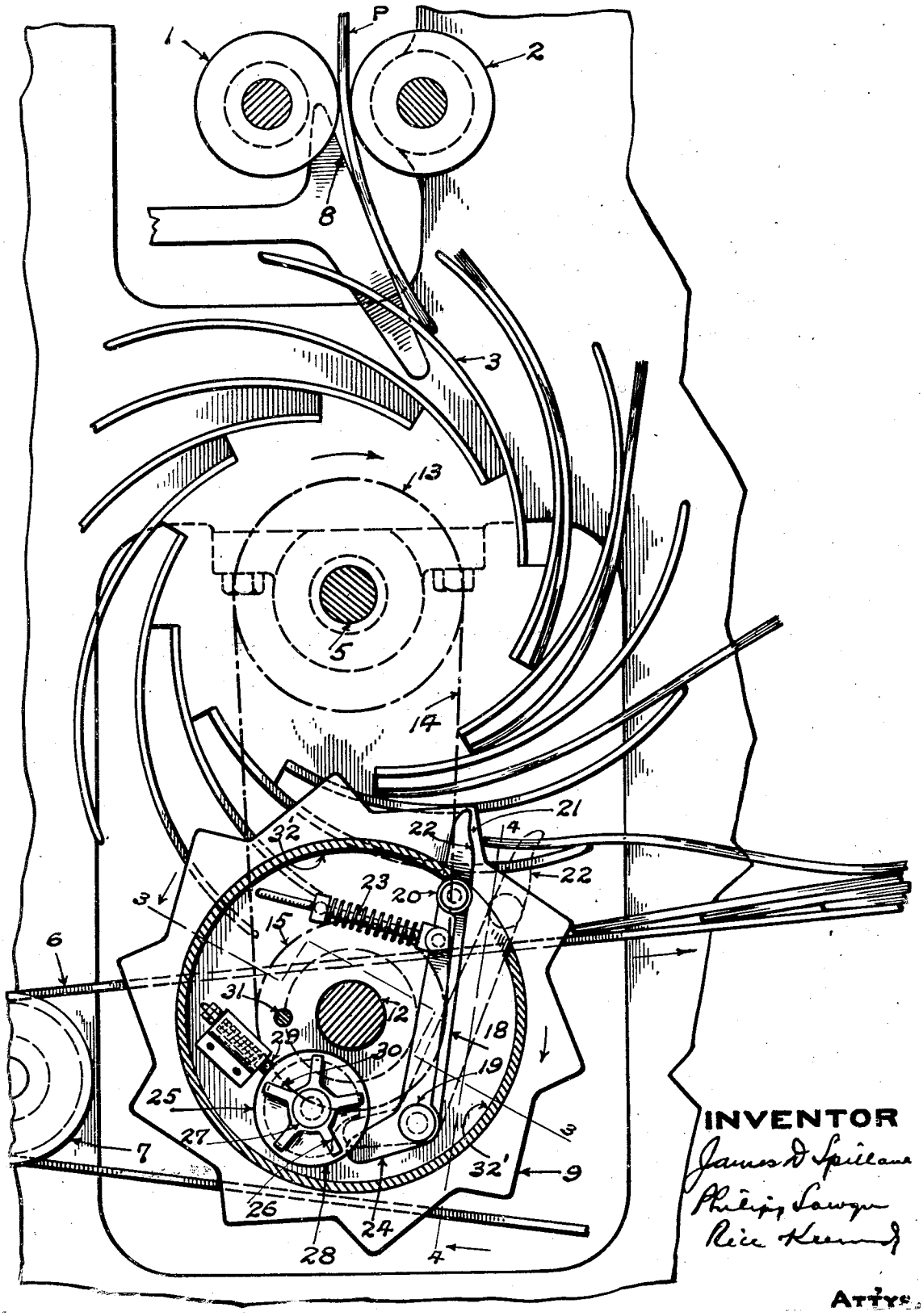
April 24, 1934. J. D. SPILLANE 1,956,541

DELIVERY MECHANISM FOR PRINTING MACHINES

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- FIG. 1. -



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DELIVERY MECHANISM FOR PRINTING MACHINES

Filed June 16, 1931 3 Sheets-Sheet 2

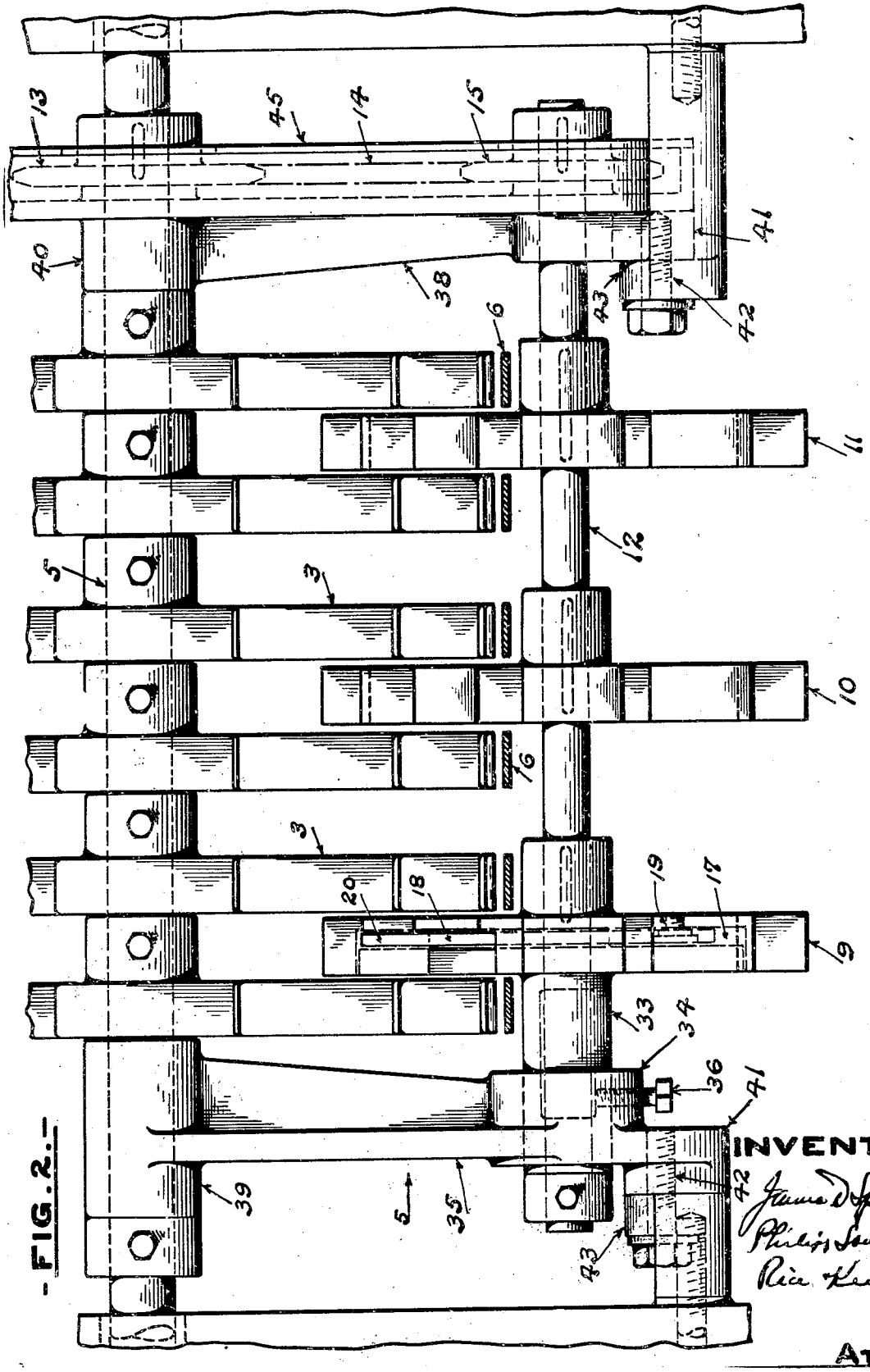


FIG. 2.

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DELIVERY MECHANISM FOR PRINTING MACHINES

Filed June 16, 1931 3 Sheets-Sheet 3

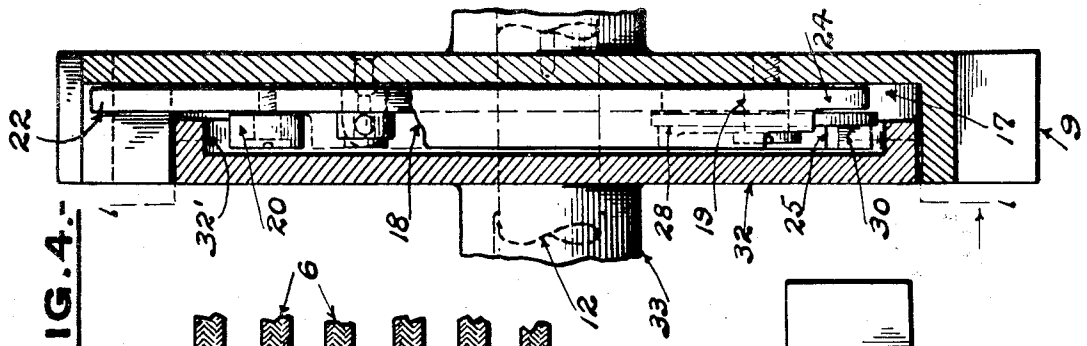


FIG. 4.

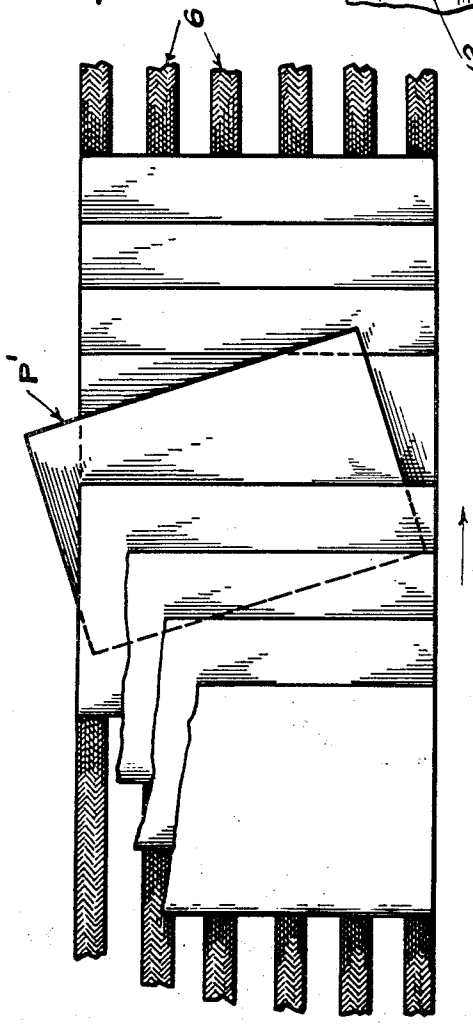


FIG. 6.

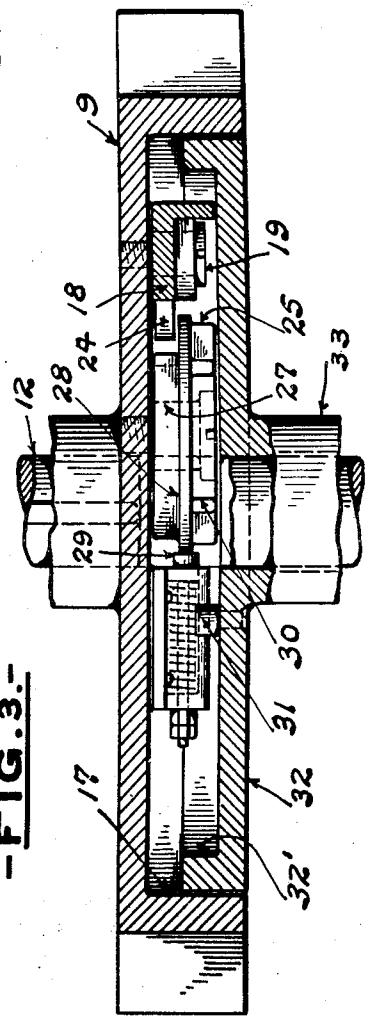


FIG. 3.

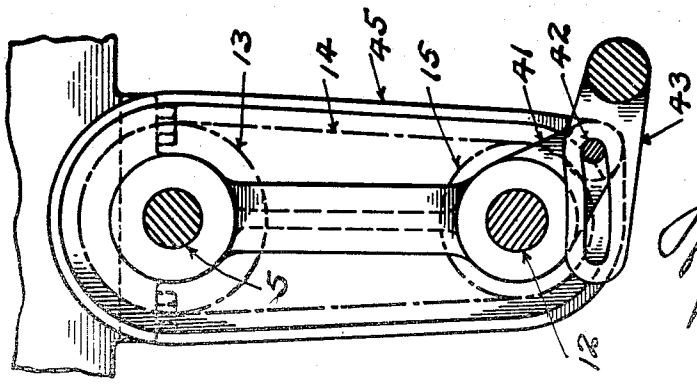


FIG. 5.

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UNITED STATES PATENT OFFICE

1,956,541

DELIVERY MECHANISM FOR PRINTING MACHINES

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Application June 16, 1931, Serial No. 544,761

21 Claims. (Cl. 93—93)

This invention relates to certain improvements in delivery mechanism for the folders of high speed printing machines, particularly fly or fan deliveries.

In stripper or pushing mechanism used with a fly or fan delivery as ordinarily constructed with a stationary stripper for freeing the product, there is apt to be some rebound and the sheets are not deposited on the belts or other delivery evenly when operating at high speed.

It is one object of the present invention to provide a rotary stripper mechanism used in conjunction with a fan or fly delivery which engages the folded edge of the product and pushes it out of the blades of the fan to free it, this arrangement laying the products on the belts or other delivery in evenly spaced relation and perfect alignment without rebound.

It is a further object of the invention to provide a kicker mechanism carried by and operating with the rotary stripper mechanism, so as to provide a simple construction, which acts to throw a predetermined product out of alignment with the other products to effect a count.

It is a further object of the invention to provide an improved guide or deflector for directing the products into the fan or fly blades.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the appended claims.

In these drawings,—

Figure 1 is an end elevation of the impoved delivery showing the invention, the view being partly broken away and partly in section;

Figure 2 is a side view of the construction shown in Figure 1;

Figure 3 is a detail sectional plan view of the kicker mechanism, the section being taken on the broken line 3—3 of Figure 1;

Figure 4 is a detail vertical section of the kicker mechanism, the view being taken on the line 4—4 of Figure 1;

Figure 5 is a detail view, partly in section, taken in the direction of arrow 5 of Figure 2, and

Figure 6 is a plan view showing the tapes and the arrangement of the products on the tapes produced by the mechanisms of the present invention.

Referring now to these drawings, the usual folding-off rolls are shown, marked 1, 2, and a product P being drawn between them and led to a blade 3 of a fan delivery of usual construction supported on a shaft 5, driven from any suitable power source, not shown. These blades are, as shown (see Figure 2), spaced to allow certain mechanisms, hereinafter referred to, to pass between them. The fan delivers to a traveling delivery shown in the form of tapes 6 to which the fan blades 3 deliver, these tapes running over pulleys, one of which is indicated at 7 in Figure 1. According to one feature of the invention, there is provided a fixed guide or deflector plate 8, suitably supported in the frame of the machine, which acts to accurately guide the product onto the fan blade 3, so that it is in proper position for the blade to deliver it as hereinafter referred to.

In accordance with the invention, a mechanism of improved form is provided for accurately pushing or stripping the product and freeing it from the blades of the fan. This includes generally a rotary mechanism which pushes or strips the product from the blade so that successive products are laid in accurate and regular arrangement as they are laid on the tapes with no rebound. This mechanism also preferably includes a kicker device by which a predetermined product may be pushed or kicked out sidewise from the others so as to effect a count of the products, this kicker being carried by the stripping mechanism.

While these mechanisms may vary in construction, as shown, there is provided a rotary member having a plurality of projections adapted to engage the folded edge of a product and push or strip it from the fan blade, the projections operating between the blades of the fan. Specifically this rotary member is in the form of a star wheel, and in the construction shown there are three of these wheels 9, 10, and 11, mounted on a shaft 12. This shaft 12 is driven from the shaft 5 of the fan by a sprocket 13 on that shaft and a chain 14 passing over a sprocket 15 on the shaft 12, the parts being so timed that a tooth 16 of the star wheel engages each successive folded product.

In the particular construction shown, two of the star wheels 10, 11 are solid wheels or discs, and the other 9, that is, the one at the left of Figure 2, is recessed, as best shown in Figures 3 and 4, to carry the kicker mechanism by which a product P' is displaced sidewise, as shown in Figure 6. The particular construction shown is capacitated to kick out every fiftieth product, and the star wheels are provided with ten teeth, and the kicker mechanism is so arranged as to act at every fifth revolution of the star wheel so as to kick out or disarrange every fiftieth product.

While this kicker mechanism may be variously

constructed, it is preferably, for simplicity, located in the recess 17 of the star wheel 9. This kicker mechanism includes a rocking arm 18 pivoted on a stud 19 to the inner or right hand side of the recess 17, as best shown in Figure 4. The arm 18 carries a roller 20 rotatably supported thereon, the function of which will be hereinafter described. A portion 21 of this arm projects beyond the recess and in its normal position lies behind the plane of the leading edge of one of the teeth of the star wheel, as shown in Figure 1. In the construction shown, however, at every fifth revolution of the star wheel this arm is given a forward movement, as shown in dotted lines in Figure 1, so that the engaging face 22 engages the folded edge of a product and kicks or pushes the product so that it is laterally displaced with respect to the preceding and succeeding products, and a count is effected.

The mechanism by which this movement is given the arm may be varied within certain limits. As illustrated, the arm is operated by a spring rod construction 23, the arm being held normally against the action of the spring by mechanism which will now be described. A flange or disk 32, which is fixedly supported, is formed with an interrupted ring having an inner surface 32' that is adapted to engage with the roller 20, and when thus engaged the face 22 of the kicker lever is held back of the leading edge of the star wheel tooth. As the star wheel is turned, however, and the roller comes opposite to the cut-away portion of the ring, the lever is free to be acted upon by the spring 23, unless otherwise restrained. As shown, the arm is provided with a tail or toe 24 which engages with a rotating disc or counting wheel 25. The periphery of this disc is continuous, except at one point where it is cut away, as indicated at 26, and when this cut-away portion reaches the tail 24, the tail is free to enter this cutout and permit the spring 23 to operate the arm to the dotted position of Figure 1, when the roller 20 reaches the cut-away portion of the ring. As the star wheel continues its forward movement, the roller 20 again engages the ring face 32', the arm 18 is pressed back to its normal position, and the tail is lifted out of the cut-out portion of the disc 25.

As stated, the disc 25 is rotatably mounted on a stud 27 secured to the outer or uppermost side of the star wheel, as indicated in Figure 3, and is provided with a flange 28 with which cooperates a spring pressed brake 29, the purpose of which will hereinafter be referred to. The disc is provided, on the side of the flange 28 opposite to that portion having the cutout 26, with projections in the form of ribs 30 extending radially of the disc. In the present construction, where fifty products are to be counted, five of these counting ribs are provided.

The ribs 30 on this counting disc engage with a pin 31 which is carried on flange 32 (best shown in Figure 3) provided with a hub 33 secured in a hub 34 of a bracket arm 35 by a set screw 36. The hub 33 is hollow and acts as a bearing for one end of the shaft 12 on which the star wheels are supported, the other end of the shaft 12 being supported in a bearing hub on the end of a bracket arm 38.

The pin 31 is thus stationary relatively to the star wheel 9, and with this construction on each revolution of the star wheel the counting disc will be moved forward one rib 30, and on every fifth revolution of the star wheel the cut-away portion of the disc 25 will permit the tail 24 of the arm 18 to drop into it and allow the spring 23 to throw the arm to the dotted line position of Figure 1 and kick a product laterally out of alignment with respect to the rest of the products, and effect a count. The provision of the spring pressed brake 29 keeps the counting disc 25 from overthrowing when the ribs 30 engage the pin 31 and thus permits the proper seating of the tail of the arm 18 in the cutout 26.

It will be understood that while the mechanism shown will effect a count of fifty, other counts can be made by changing the proportions of the star wheel and associated kicker mechanism, and the invention is not to be limited to a fifty count.

As shown, the upper ends of the bracket arms 35, 38 are hung from hubs 39, 40 on the fan or fly shaft 5. In the best constructions, means may be provided for adjusting the shaft 12 carrying the star wheels relatively to the fan. As shown in Figures 2 and 5, the hubs 34 of the bracket arms 35, 38 are provided with arms 41 through which pass bolts 42 which also pass through a slotted arm 43 on hubs 44 suitably secured to the frames of the machine. With this mechanism an adjustment of the star wheels relatively to the fan is effected. A gear guard 45 may also be provided for protecting the sprockets and chain by which the shaft 12 is driven as above described.

It will be seen from the foregoing description that a simple stripper or pushing mechanism has been devised for use with a fan or fly delivery, one which is very conveniently combined with a kicking or counting mechanism, and one in which the products are accurately positioned on the tapes or other traveling delivery and counted. While the invention has been described in its preferred form, it will be understood that other constructions might be devised for carrying out the invention and it is therefore not to be restricted to the specific construction shown and described, and that this may be varied within the scope of the appended claims.

What I claim is:

1. In a delivery, the combination of means for forwarding products, a fly or fan to which the products are forwarded, and a rotary mechanism for freeing successive products from the fan, said mechanism having means intermittently actuated for displacing a product from the others of said products.

2. In a delivery, the combination of means for forwarding products, a fly or fan to which the products are forwarded, a rotary mechanism for freeing the products from the fan, and mechanism cooperating with the rotary mechanism for laterally displacing a predetermined product.

3. In a delivery, the combination of means for forwarding products, a fly or fan to which the products are forwarded, a rotary mechanism for freeing the products from the fan, and a kicker mechanism carried by the rotary mechanism for laterally displacing a predetermined product.

4. In a fan or fly delivery, the combination with the fan, of a rotary wheel or disc having projections arranged to engage the edge of successive folded products and free them from the fan.

5. In a fan or fly delivery, the combination with the fan, of a rotary member having projections arranged to engage the edge of a folded product and free it from the fan, and a kicker

mechanism carried by the member for displacing a predetermined product.

6. In a fan or fly delivery, a fan, and a rotary wheel having projections, one for each product, arranged to engage a product and free it from the fan.

7. In a fan or fly delivery, a fan, and a rotary wheel having teeth, one for each product, arranged to engage a product and free it from the fan.

8. In a fan or fly delivery, a fan, a rotary toothed wheel arranged to engage a product and free it from the fan, a recess in the wheel, and a counting kicker mechanism located in the recess.

9. In a fly or fan delivery, a fan, a toothed wheel arranged to free successive products from the fan, a counting wheel, and means operated by the counting wheel for displacing a predetermined product.

10. In a fly or fan delivery, a fan, a toothed wheel arranged to free a product from the fan, a kicker arm carried by the wheel, a counting wheel carried by the toothed wheel, and means controlled by the counting wheel for causing the arm to displace a predetermined product.

11. In a fly or fan delivery, a fan, a toothed wheel arranged to free a product from the fan, a kicker arm carried by the wheel, a counting wheel carried by the toothed wheel, a cutout in the counting wheel into which the end of the arm may enter, and a spring for moving the arm to engage and displace a predetermined product.

12. In a fan or fly delivery, a combined mechanism for freeing successive products from the fan and for counting a predetermined number of products, said mechanism including means intermittently actuated for displacing a product and thereby separating said products into equal groups.

13. In a fan or fly delivery, a toothed wheel for freeing a product from the fan, a recess in the wheel, and mechanism in the recess for counting a predetermined number of products.

14. In a fan or fly delivery, a toothed wheel for freeing a product from the fan, a recess in the wheel, a kicker device, and a counting wheel in the recess actuating the kicker device to count a predetermined number of products.

15. In a fan or fly delivery, a toothed wheel for freeing a product from the fan, a recess in the wheel, a counting wheel in the recess, a kicker device, and means for operating the counting wheel in timed relation with the toothed wheel actuating the kicker device to count a predetermined number of products.

16. In a fly or fan delivery, a fan, a toothed wheel arranged to free a product from the fan, a kicker arm carried by the wheel, a counting wheel carried by the toothed wheel, means controlled by the counting wheel for causing the arm to displace a predetermined product, and braking means for the counting wheel.

17. In a fly or fan delivery, a fan, a toothed wheel for freeing a product from the fan, a recess in the wheel, a kicker arm carried in the recess, a counting wheel having radial projections carried in the recess, a relatively fixed pin for operating the counting wheel by the rotation of the toothed wheel, and means controlled by the counting wheel for causing the arm to displace a predetermined product.

18. In a delivery, the combination of means for forwarding products, a fly or fan to which the products are forwarded, a rotary mechanism for freeing the products from the fan, and means for effecting a relative adjustment between the fan and the rotary mechanism.

19. In a delivery, the combination of means for forwarding products, a fly or fan to which the products are forwarded, a rotary mechanism for freeing the products from the fan, a counting mechanism carried by the rotary mechanism, and means for effecting a relative adjustment between the fan and the rotary mechanism.

20. In a fan or fly delivery, the combination with the fan of a traveling delivery to which products are delivered by the fan, and a rotary mechanism having portions arranged to engage successive products and acting to free the products from the fan and position them in alignment on the delivery, said mechanism including intermittently actuated means for displacing an individual product.

21. In a fan or fly delivery, the combination with the fan of a traveling delivery, and a star wheel arranged to engage successive products to free them from the fan and position them in alignment on the delivery.

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