

June 6, 1939.

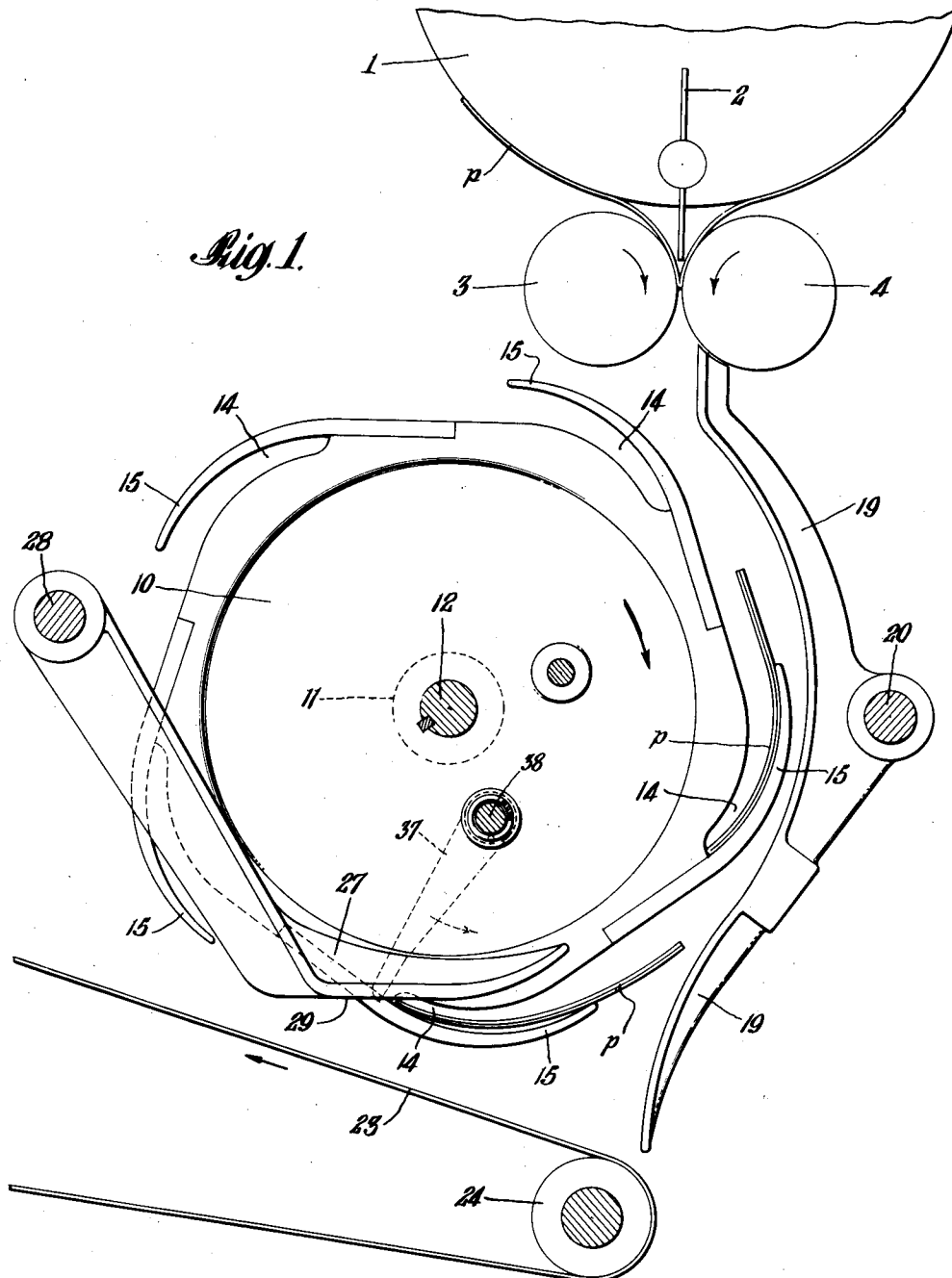
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2,161,033

DELIVERY AND COUNTING MECHANISM FOR ROTARY PRINTING PRESSES

Filed Oct. 21, 1937

3 Sheets-Sheet 1



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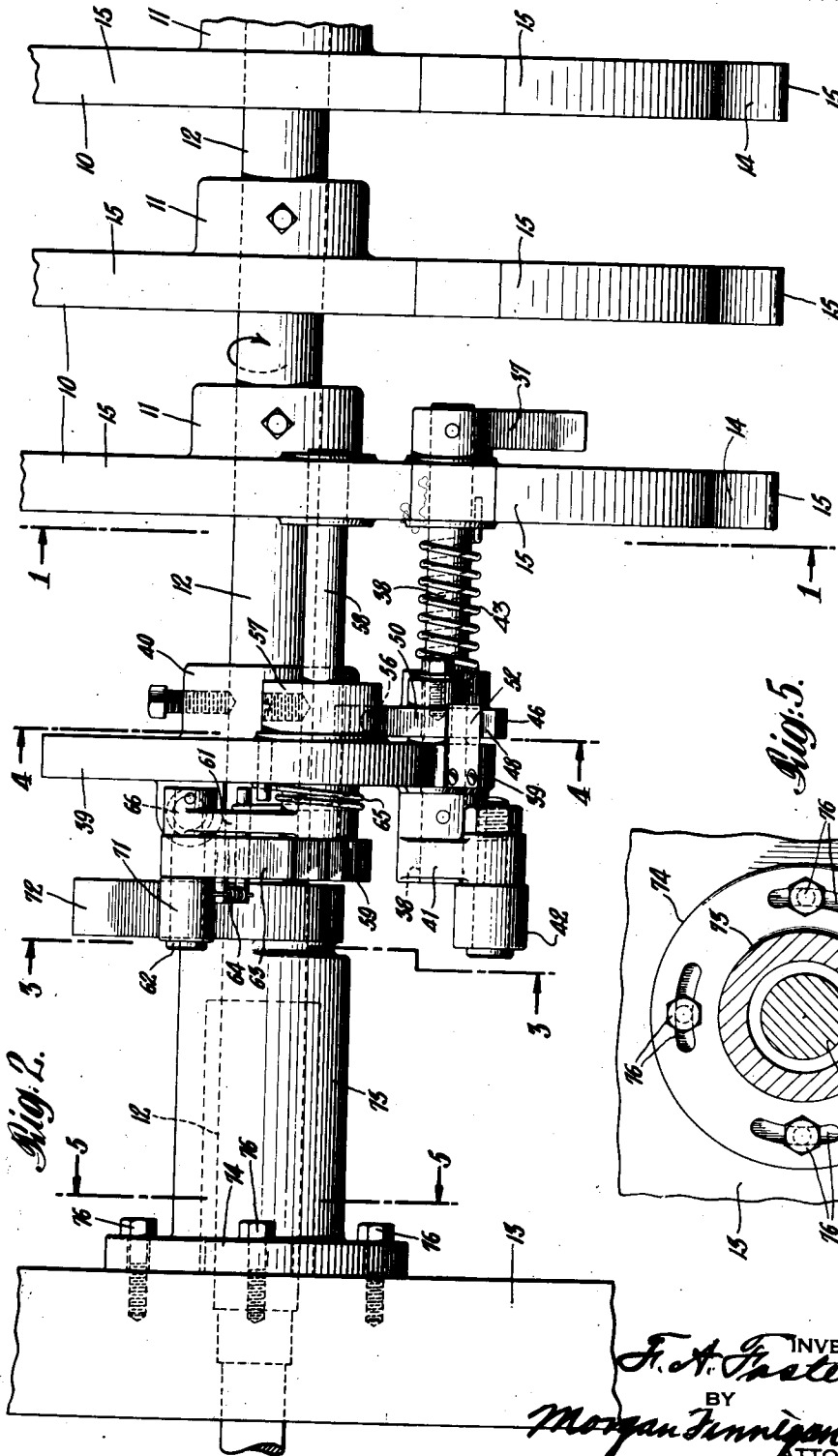
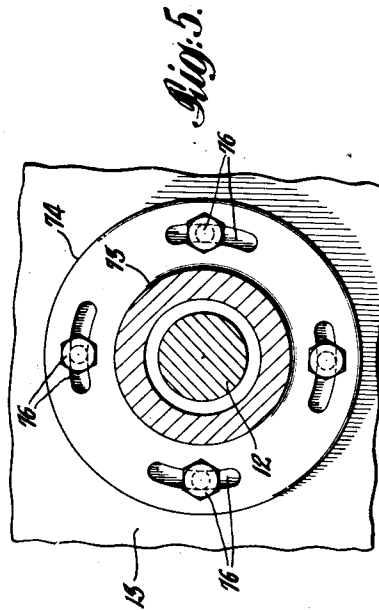
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DELIVERY AND COUNTING MECHANISM FOR ROTARY PRINTING PRESSES

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3 Sheets-Sheet 2



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DELIVERY AND COUNTING MECHANISM FOR ROTARY PRINTING PRESSES

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3 Sheets-Sheet 3

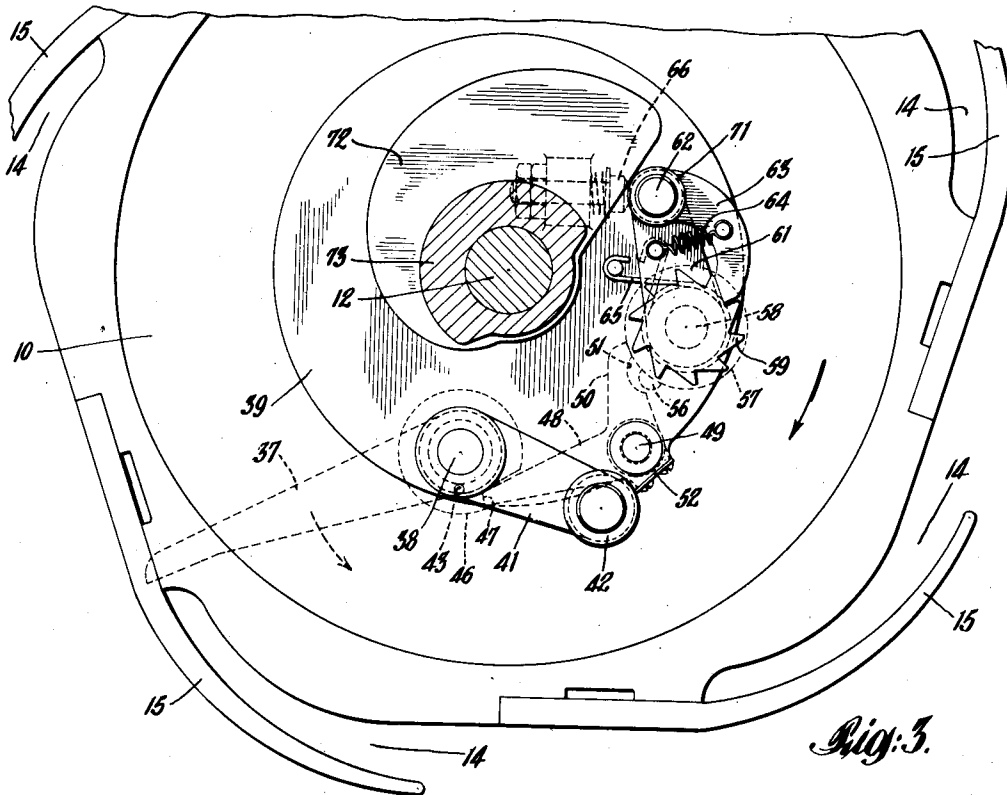


Fig. 3.

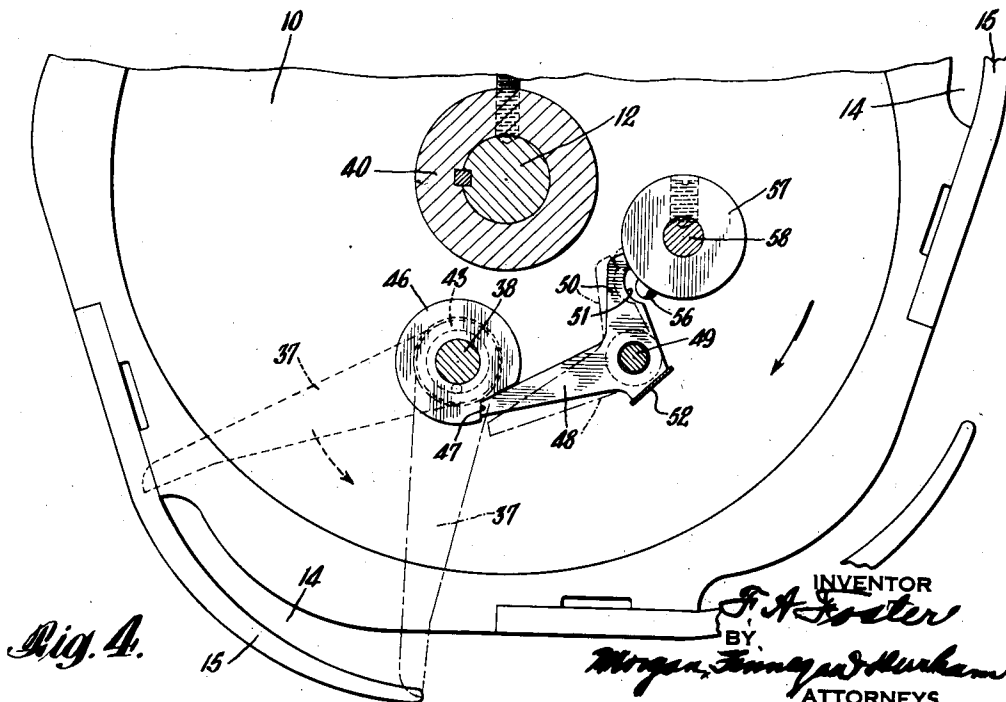


Fig. 4.

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2,161,033

DELIVERY AND COUNTING MECHANISM FOR
ROTARY PRINTING PRESSESFrank A. Foster, Maywood, Ill., assignor to The
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corporation of Illinois

Application October 21, 1937, Serial No. 170,237

23 Claims. (Cl. 93—93)

The invention relates to new and useful improvements in paper counting means for newspaper printing presses, and more particularly to such improvements especially adapted for use with the fly delivery in high speed rotary presses.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a transverse vertical section, partly diagrammatic, showing a rotary folding-off, delivery and counting mechanism embodying the invention, a portion of it being taken on line 1—1 of Fig. 2;

Fig. 2 is a side elevation, looking at the central part of Fig. 1 from the right, and showing also the mechanism of the other figures;

Fig. 3 is a transverse vertical section on line 3—3 of Fig. 2;

Fig. 4 is a transverse vertical section on line 4—4 of Fig. 2; and

Fig. 5 is a transverse vertical section on line 5—5 of Fig. 2.

Objects of the invention are to provide a simple, sturdy and smoothly-acting paper delivery and counting mechanism especially adapted for use in modern high speed rotary deliveries; to utilize rotative movement practically throughout, and to obviate the use in cooperation of stationary parts and very rapidly moving parts, and to avoid the impact of stationary parts on independently rapidly rotating parts or articles; to avoid all sudden and impactive actions, including such actions between stationary mechanism, or suddenly started mechanism, and rapidly rotating papers; to provide counting means rotating with the paper delivery, having its own limited, smooth and relatively slow movements while moving with the rapidly rotating fly delivery; to provide such mechanism having only rotative movements; and to provide such mechanism which does not impart sudden and forceful movement to the rapidly rotating papers.

With these and other objects in view, a counting mechanism is provided which rotates with the rotating fly, and has also its own rotative movement, and is provided with a counting member which rotates with the fly and is controlled and actuated to pass into and out of operative relation with one of the fly pockets, after a predetermined number of rotations of the fly to sweep the paper from said pocket as it is about to leave the pocket and thus to indicate the count.

The present preferred embodiment comprises a kicker arm mounted upon and rotating with the rapidly rotating fly, and means for maintaining the kicker arm inactive for a predetermined number of revolutions of the fly and for then actuating it to displace a paper at delivery to mark the count in the usual manner. In said embodiment the kicker arm, mounted on the fly disc in operative relation to a paper pocket, is mounted on a spring-impelled shaft, which is held from rotation and against its spring by a detent lever. The detent lever releases the shaft, after a predetermined number of revolutions of the fly, by means of a rotated holding and release mechanism for the detent lever, which is rotated step by step on successive rotations of the fly. This comprises a cam which actuates the detent lever, the cam being fixed on a shaft which is journaled in the rotating fly mechanism; and a pawl and ratchet mechanism also fixed on the shaft, the pawl and ratchet being advanced step by step, on successive rotations of the fly, through the agency of a stationary cam, which cam also acts to restore the kicker arm to inactive position. It will be understood that the foregoing general description and the following detailed description as well are explanatory and exemplary, but are not restrictive of the invention.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawings, a rotary transverse folder of a well-known type is shown conventionally, and includes a cylinder 1 having a rotatable folding blade 2 which folds off the middle of the associated sheets *p* into the bite of a pair of folding-off rollers 3 and 4 in a well-known manner. The cross-folded product *p* is delivered from the folding-off rollers 3 and 4 into a rotary fly delivery, which in turn lays the folded papers on a traveling delivery belt. As here shown, the fly delivery comprises a plurality of spaced-apart, side-by-side discs 10, having hubs 11 mounted on and fixed to a shaft 12,

which shaft is journaled in the side frames 13 on the press, and is rotated in any suitable manner. The discs 10 have a plurality of paper-carrying pockets 14 on their peripheries, the pockets being formed between shaped portions of the disc periphery and fingers or blades 15 fixed to the peripheries of the respective discs to form the exterior side of the paper-receiving pockets.

A series of spaced-apart, side-by-side stationary guides 19 are mounted on a supporting rod 20, the guides 19 being positioned in front of and in alinement with the pockets 14 on the corresponding delivery discs. Beneath the rotary fly is a delivery belt 23 running over rollers 24 at either end, the belt being intermittently or continuously movable as may be desired, the folded papers from the fly pocket being delivered to and laid upon the belt in stepped echelon relation in a well-known manner. Cooperating with the pockets 14 at the delivery point are a corresponding series of stop arms 27, located alongside the respective fly discs and just above the delivery point of the papers from the pockets to the conveyor belt 23. The stop arms 27 are supported in fixed position upon a transversely-disposed supporting rod 28, the lower faces 29 of the arms 27 engaging with the folded forward edge of the paper to move it out of the rotating fly pocket and deliver it to the conveyor belt.

The paper displacing means which operates, after the delivery of a predetermined number of papers to the delivery belt, to displace a paper to indicate the count, comprises a kicker arm 37 mounted on one of the fly discs so that, after a predetermined number of revolutions, it will kick the paper in a fly pocket to displace it for the count as it is delivered to the delivery tapes. As embodied, kicker arm 37 is fixed on a shaft 38, which shaft is rotatively journaled in a fly disc 10, and is journaled at its other end in a member rotating with the disc 10, shown as a disc 39 having a hub 40 fixed to the shaft 12. The shaft 38 extends beyond the disc 39 and on the projecting end of the shaft, on the other side of the disc, there is fixed an arm 41 having at its end a cam roller 42. Shaft 38 is under spring impulsion to rotate in counter-clockwise direction, and is normally held against rotation by means later described. Coil spring 43 encircles shaft 38 between the discs 10 and 39, and tends to rotate the shaft in the counter-clockwise direction in Figs. 3 and 4, that is, the spring tends to move the arm 37 from the dotted line to the broken line position in Fig. 4 to effect the displacement of a paper in a particular pocket to indicate the count.

Means are provided for normally holding shaft 38 against the impulsion of spring 43, and for releasing it at the proper time for displacing the predetermined paper and then restoring the mechanism. As embodied, there is fixed to shaft 38, on the inner side of the disc 39, a collar 46 having in its periphery a detent notch 47. A cooperating detent lever 48 is pivotally mounted on a pin 49, which is fixed in and projects from the disc 39. The inner end of lever 48 engages in the detent notch 47, and the outer arm 50 of lever 48 has its outer end curved to fit the periphery of cam 57 (Fig. 4), so that the cam will rotate beneath the contacting end of the lever without rocking the lever or disturbing its hold on shaft 38. Adjacent its curved end, lever arm 50 has a curved cam surface 51, which is engaged by a projection 56 in the periphery of

cam 57, the projection engaging the surface 51 to rock detent lever 48 from its notch 47 after a predetermined number of revolutions of the fly discs. A spring 52 is mounted on disc 39 and resiliently holds detent lever 48 in the notch 47 and thereby holds arm 41 and the kicker arm against the action of spring 43.

The embodied form of means for periodically releasing the kicker arm 37 to cause it to swing past the paper pocket to displace the count indicating paper comprises a circular cam 57 fixed on a shaft 53, which shaft is rotatably journaled in the end fly disc 10 and in the disc 39, and is given a step-by-step angular advance on each rotation of the fly discs. On the circular periphery of cam 57 is a projection 56, which once on each rotation of the cam engages in the depression 54 on lever arm 50 to rock detent lever 48 to release collar 46 and shaft 38. Shaft 53 is advanced angularly intermittently on each rotation of the fly. The shaft 53 extends through the disc 39 and fixed on the outer end of this shaft, on the opposite side of disc 39, is a ratchet wheel 58. As here embodied, the ratchet wheel has ten teeth and is advanced one tooth for each revolution of the fly, and thus the count is marked by displacing a paper on every tenth revolution of the fly. Loosely mounted on shaft 58 between disc 39 and ratchet wheel 59 is a pawl lever 61, having a pin 62 mounted in its outer end, and a pawl 63 pivotally mounted on pin 62 engages with the teeth of the ratchet wheel 59 and is spring-held thereto by a spring 64 in tension between the pawl and its lever. A coil spring 65 encircles the hub of lever arm 61, and its ends are connected to the pawl lever arm and to disc 39. It holds the pawl in retracted position, and its movement in that direction is limited by a spring stop pin 68, spring mounted on a lug fixed to and projecting from the side face of disc 39. The actuating means for the pawl and ratchet mechanism comprises a cam roller 71 mounted on the pin 62 of the pawl lever, which roller coacts with a stationary cam 72. The cam 72 is shown integral with a sleeve 73, surrounding the shaft 12 and having an annular flange 74, abutting on and bolted to the machine frame 13 by a plurality of bolt and slot connections 76, which provide angular adjustment for the cam.

The manner of operation of the foregoing mechanism is as follows: In the illustrated mechanism, the fly discs have five pockets around, and the count is made on the fiftieth paper, that is, after ten revolutions of the fly mechanism. As the fly mechanism rotates, the folded papers are delivered by the feeding-off rollers 3 and 4 into the fly pockets 14, and are delivered from the pockets onto the delivery tapes 23, in a known manner. At this time detent 48 holds the kicker arm 37 in its retracted or dotted line position (Figs. 3 and 4) with respect to its paper pocket 14, and the end face of the arm 50 of the detent lever 48 is riding on the smooth periphery of cam disc 57, which rotates intermittently without moving the detent lever. On each revolution of the fly mechanism cam roller 71 rides around stationary cam 72, and once on each revolution of the fly pawl lever 61 is rocked against its spring 65 and feeds ratchet wheel 59 forward one tooth. The ratchet wheel in this instance has ten teeth, and the ratchet wheel is advanced one tooth on each of nine successive revolutions of the fly, and during those nine revolutions the end 50 of the detent lever is riding on the smooth periphery of cam disc 57 and the

detent lever remains in the notch 47 and holds the kicker arm 37 inactive.

On the tenth revolution of the fly the projection 56 in the periphery of cam 57 enters the recess 51 in lever arm 50 and rocks the detent lever to the broken line position in Fig. 4, and thereby releases shaft 38 which under the impulsion of spring 43 is rotated in the counter-clockwise direction and kicker arm 37 is moved from the dotted line position to the broken line position in Fig. 4, and displaces the paper in pocket 14 just as it is delivered to the delivery tapes 23. Arm 41, which is fixed to shaft 38, moves with arm 37 and the movement of arm 37 is stopped when the cam roller 42 on arm 41 engages the low part of the cam 72. As the fly continues its rotation, cam roller 42 rides up on cam 72, reversely rocks shaft 38 and brings back arm 37 from the broken line position to the dotted line position (Fig. 4), and detent lever 48 snaps into notch 47 and holds the arm 37 in inactive position until the described cycle is again repeated. Arm 41 at the same time is rocked away from cam 72 into the position shown in Fig. 3, and the kicker mechanism is held until the tenth succeeding revolution of the fly.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotary fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on the fly, means for intermittently actuating said counter arm relatively to a fly pocket to effect the paper count, and means for receiving papers from the fly pockets.

2. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotary fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on the fly, means including a pawl and ratchet for intermittently actuating said counter arm relatively to a fly pocket to effect the paper count, and means for receiving papers from the fly pockets.

3. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotary fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on the fly, means including an eccentric member for intermittently actuating said counter arm relatively to a fly pocket to effect the paper count, and means for receiving papers from the fly pockets.

4. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotary fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on the fly, means including a cam, a counter arm actuating spring and an intermittently operating detent and release for the counter arm for intermittently actuating said counter arm relatively to a fly pocket to effect the paper count, and means for receiving papers from the fly pockets.

5. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotary fly having peripheral pockets to

receive the folded papers, a counter arm rotatably mounted on the fly, means including a cam, a counter arm actuating spring, an intermittently operating detent and release for the spring, and a pawl and ratchet actuated by the cam for controlling the detent for intermittently actuating said counter arm relatively to a fly pocket to effect the paper count, and means for receiving papers from the fly pockets.

6. A rotary newspaper delivering and counting mechanism including in combination folding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for intermittently actuating said counter arm, means mounted independently of said rotating fly for causing said arm actuating means to move said counter arm to displace a paper to effect the count, and means for receiving papers from the fly pockets.

7. A rotary newspaper delivering and counting mechanism including in combination folding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for intermittently actuating said counter arm, means including an eccentric actuating member mounted independently of the fly, for causing said arm actuating means to move said counter arm to displace a paper to effect the count, and means for receiving papers from the fly pockets.

8. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a spring-actuated counter arm rotatably mounted on said fly, means mounted to rotate with said fly for actuating said counter arm, means mounted independently of said rotating fly for actuating said arm actuating means to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.

9. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for actuating said counter arm including a pawl and ratchet mechanism, means mounted independently of said rotating fly for actuating said arm actuating means to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.

10. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for actuating said counter arm including a pawl and ratchet mechanism, means mounted independently of said rotating fly for actuating said pawl and ratchet mechanism to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.

11. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to

- rotate with said fly for actuating said counter arm, including a spring pressed shaft and a detent holding said shaft, means mounted independently of said rotating fly for actuating said arm actuating means to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.
- 10 12. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for actuating said counter arm, including a spring pressed shaft and a detent holding said shaft and a device for releasing the detent, means mounted independently of said rotating fly for actuating said arm actuating means to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.
- 15 13. A rotary newspaper delivering and counting mechanism including in combination feeding-off rollers, a rotatable fly having peripheral pockets to receive the folded papers, a counter arm rotatably mounted on said fly, means mounted to rotate with said fly for actuating said counter arm, including a spring pressed shaft and a detent holding said shaft and a device for releasing the detent, and a pawl and ratchet controlling the releasing device, means mounted independently of said rotating fly for actuating said arm actuating means to cause said counter arm after a predetermined number of rotations of said fly to displace a paper to effect the count, and means for receiving papers from the fly pockets.
- 20 14. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral pockets, a kicker arm rotatably mounted on said fly and adapted to displace a folded paper in one of said pockets, a stationary cam, an arm engaging the cam and connected to said kicker arm, an actuating spring, a detent normally holding said kicker arm and cam arm in inoperative position against said spring for a plurality of revolutions of the fly, and means for throwing out said detent after a predetermined number of revolutions of the fly to cause the kicker arm to displace a paper in one of the fly pockets.
- 25 15. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral pockets, a kicker arm rotatably mounted on said fly and adapted to displace a folded paper in one of said pockets, a stationary cam, an arm engaging the cam and connected to said kicker arm, an actuating spring, a detent normally holding said kicker arm and cam arm in inoperative position against said spring for a plurality of revolutions of the fly, and means including a pawl and ratchet mechanism for throwing out said detent after a predetermined number of revolutions of the fly to cause the kicker arm to displace a paper in one of the fly pockets.
- 30 16. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral pockets, a kicker arm rotatably mounted on said fly and adapted to displace a folded paper in one of said pockets, a stationary cam, an arm engaging the cam and connected to said kicker arm, an actuating spring, a detent normally holding said kicker arm and cam arm in inoperative position against said spring for a plurality of revolutions of the fly, and means including a pawl and ratchet mechanism for throwing out said detent after a predetermined number of revolutions of the fly to cause the kicker arm to displace a paper in one of the fly pockets.
- 35 17. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral paper receiving pockets, a shaft rotatably mounted in said fly, a stationary cam, a kicker arm mounted on said shaft, an arm mounted on said shaft and actuated by said cam, a device preventing actuation of said arm by said cam, and means operating after a plurality of rotations of said fly for causing the kicker arm to displace a paper in a fly pocket to effect the count.
- 40 18. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral paper receiving pockets, a shaft rotatably mounted in said fly, a stationary cam, a kicker arm mounted on said shaft, an arm mounted on said shaft and actuated by said cam, a device preventing actuation of said arm by said cam, and means controlled by said cam and operating after a plurality of rotations of said fly for causing the kicker arm to displace a paper in a fly pocket to effect the count.
- 45 19. A rotary newspaper delivering and counting mechanism including in combination a rotatable fly having peripheral paper receiving pockets, a shaft rotatably mounted on said fly, a stationary cam, a kicker arm mounted on said shaft, an arm for actuating said kicker arm and spring pressed to said cam, a detent device holding said arm against its spring, and means operating after a plurality of revolutions of said fly to release said arm from its detent to cause the kicker arm to displace a paper in a fly pocket.
- 50 20. A rotary newspaper delivering and counting mechanism including in combination folding off rollers, a rotatable fly disc having peripheral pockets to receive the folded papers, a disc adjacent and parallel to said fly disc and fixed to rotate therewith, a shaft journaled in both said discs, a spring-pressed kicker arm pivotally mounted on said shaft close to said fly disc and positioned to move across one of its paper pockets, an arm fixed on said shaft, a stationary cam for actuating said arm, a spring pressing said arm to the cam and acting to swing the arm when released by the cam, a detent spring pressed to normally hold said cam lever against the action of its spring, a second shaft mounted in said discs, a cam fixed to rotate with said second shaft and adapted to move said detent lever to release said arm after a plurality of revolutions of the fly disc, a ratchet wheel fixed on said second shaft, a pawl lever and pawl for imparting step-by-step movement to said ratchet wheel, and an arm engaging said stationary cam and actuated thereby to swing said pawl lever to advance said ratchet wheel on each rotation of the fly disc.
- 55 21. A rotary newspaper delivery and counting mechanism including in combination a plurality of rotatable, concentric, side-by-side discs, said discs having a plurality of paper-carrying pockets arranged in circumferential series about their peripheries, a paper counting device mounted on one of the end discs, said device comprising a counter arm fixed on a shaft journaled in said

disc in operative relation with one of the paper-receiving pockets in said disc, and actuating means for the counter arm comprising a second shaft journaled in said end disc, a ratchet wheel fixed on said second shaft, a lever loosely pivoted on said shaft, a spring-pressed pawl pivotally mounted on said lever and engaging the teeth of the ratchet wheel, and an eccentric mounted in non-rotating position for oscillating said lever arm, said counter arm in one of its successive angular movements being positioned to vary the depth of said pocket to cause the received paper to project as a counter.

22. A rotary newspaper delivery and counting mechanism including in combination a plurality of rotatable, concentric, side-by-side discs, said discs having a plurality of paper-carrying pockets arranged in circumferential series about their peripheries, a paper counting device mounted on one of the discs, said device comprising a counter arm rotating with the disc, and in operative relation with one of the paper-receiving pockets on said disc, and actuating means for the counter arm comprising a second shaft journaled in said end disc, a ratchet wheel fixed on said second shaft, a lever loosely pivoted on said shaft, a spring-pressed pawl pivotally mounted on said

lever and engaging the teeth of the ratchet wheel, and an eccentric mounted in non-rotating position for oscillating said lever arm, said counter arm in one of its successive angular movements being positioned to vary the depth of the pocket to cause the received paper to project as a counter.

23. A rotary newspaper delivery and counting mechanism including in combination a plurality of rotatable, concentric, side-by-side discs, said discs having a plurality of paper-carrying pockets arranged in circumferential series about their peripheries, a paper counting device mounted on one of the end discs, said device comprising a counter arm fixed on a shaft journaled in said disc in operative relation with one of the paper-receiving pockets on said disc, a second shaft and a ratchet wheel fixed on said shaft, a lever loosely pivoted on said shaft, a spring-pressed pawl pivotally mounted on said lever and engaging the teeth of the ratchet wheel, and means for actuating said lever to move the ratchet wheel, said counter arm in one of its successive angular movements being positioned to vary the depth of the pocket to cause the received paper to project as a counter.

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