

Aug. 20, 1946.

W. A. WHITEHEAD

2,406,118

COUNTING MECHANISM

Filed Sept. 16, 1943

2 Sheets-Sheet 1

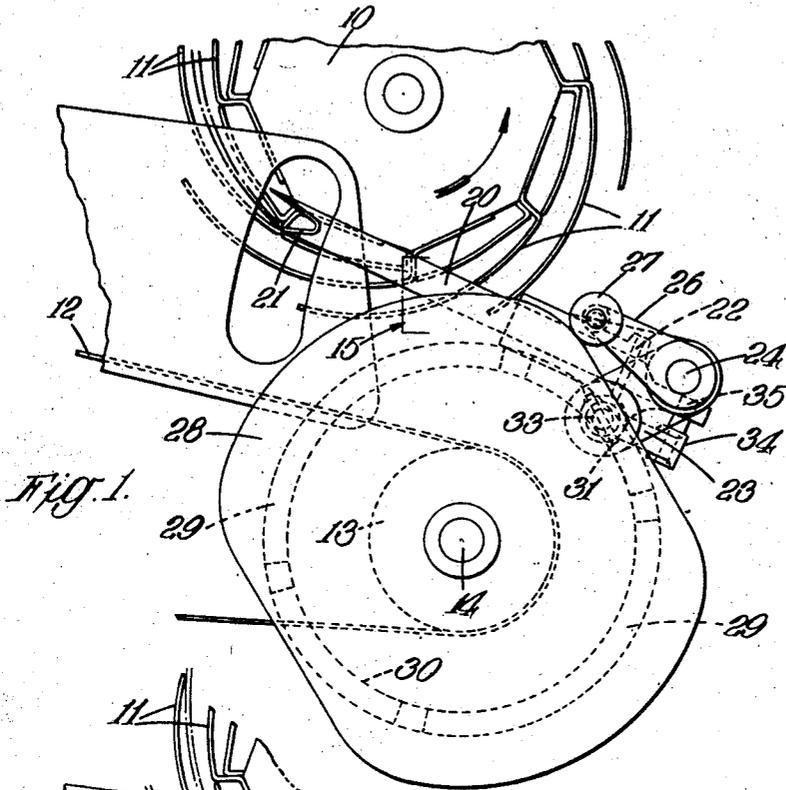


FIG. 1.

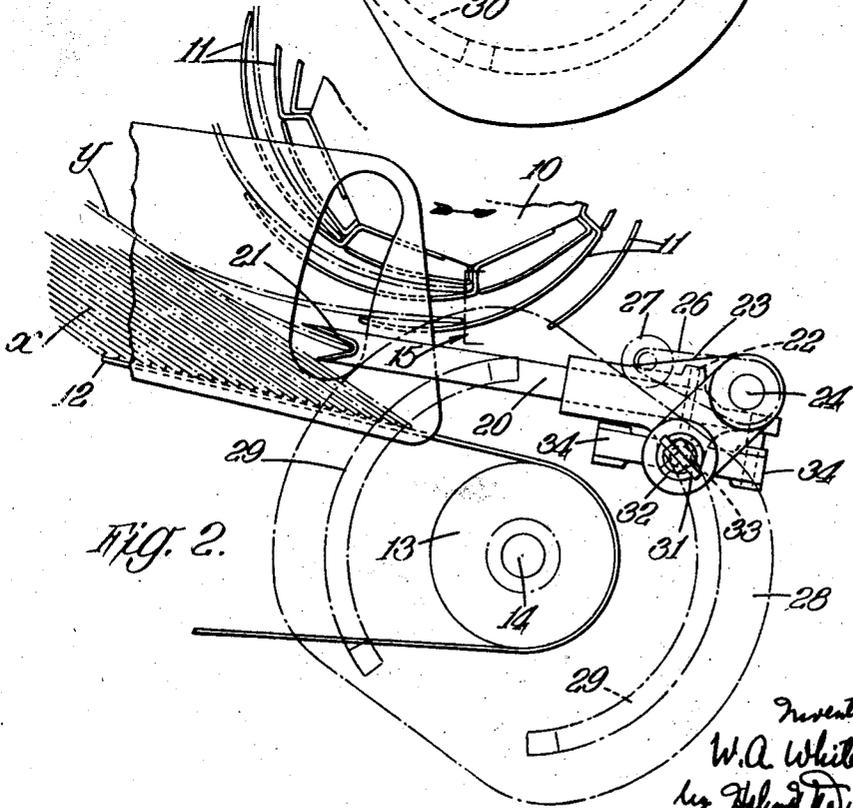


FIG. 2.

Inventor
W.A. Whitehead
by *Alfred W. Dusham*
Attorney

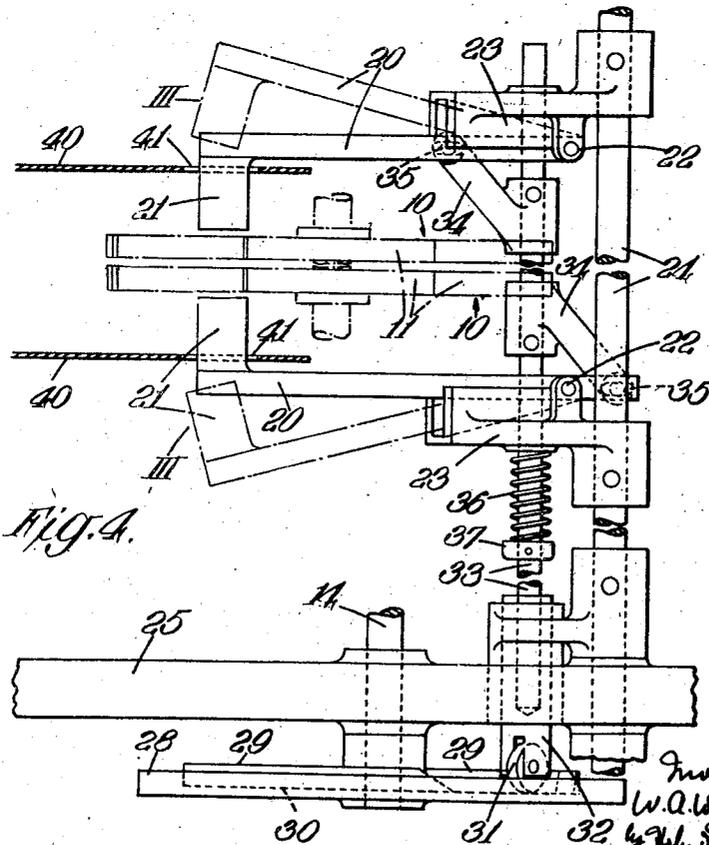
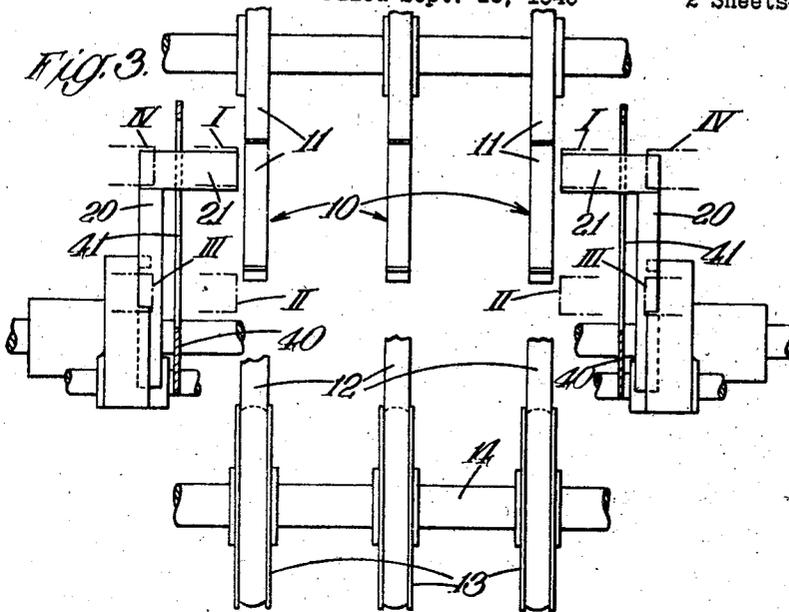
Aug. 20, 1946.

W. A. WHITEHEAD
COUNTING MECHANISM

2,406,118

Filed Sept. 16, 1943

2 Sheets-Sheet 2



Inventor
W. A. Whitehead
by *Robert D. Durham*
Attorney.

UNITED STATES PATENT OFFICE

2,406,118

COUNTING MECHANISM

William Arnold Whitehead, Preston, England, assignor to The Goss Printing Press Company, Chicago, Ill., a corporation of Illinois

Application September 16, 1943, Serial No. 502,574
In Great Britain September 23, 1942

3 Claims. (Cl. 93—93)

1

This invention relates to printing and like machines and more especially to counting mechanism therefor.

It is an object of this invention to provide a counting mechanism for printing and like machines in which the timing and setting of said mechanism is less critical or sensitive than hitherto, thereby simplifying the control. Another object of the invention is to ensure identical projection of successive "count" copies at all press speeds. A further object of the invention resides in the provision of counting mechanism which may be set mechanically prior to printing and by which the fitting of means for carrying the timing while the press is running is avoided. Still another object of the invention resides in the provision of a counting mechanism by which the "count" copies are positively controlled.

Other objects of the invention and advantages thereof will be set forth in the following detailed description of one embodiment thereof, reference being made to the annexed drawings.

In the drawings:

Fig. 1 is a side elevation of a preferred embodiment of the invention having a flipper arm at each side of the fly;

Fig. 2 is a similar view of Fig. 1 showing the flipper mechanism in a different position;

Fig. 3 is an end elevation of Fig. 1, and

Fig. 4 is a plan view of Fig. 1.

It is customary in printing machines to provide mechanism operating in association with a rotary or S fly to count the copies deposited by the fly on a moving band or conveyor by which said copies are delivered, for example, to a stacker. Counting is generally effected by causing selected copies, for example, the last copy of each quire, to project beyond copies previously deposited on the conveyor, the extent of projection of the "count" copy varying between two and six inches.

When the copies are deposited on the conveyor with their folded edges undermost and in contact with the conveyor, all copies except the "count" copy are positioned by fixed back stops which abut the folded edges of successive copies on the fly as the latter rotates and cause said copies to be deposited on the conveyor at regular intervals, each copy almost completely overlapping the preceding copy. For the purpose of projecting the "count" copy a set of movable stops has been employed, the operative faces of these stops being set forwardly of the back stops to an extent dependent upon the amount of projection required for the "count" copy. These movable stops or flippers may be cam-actuated and their

2

operation is such that they are moved into position to stop the "count" copy but do not engage or effect any of the other copies.

Actuation of the "count" copy stops both into and away from the operative position has necessarily been very fast in order that the flippers shall not come into contact with the following copies on the fly and it has been therefore important that the extent of their movement be reduced to a minimum. Further, the setting and timing of the "count" copy stop actuating mechanism has been so highly sensitive that changes in the speed of the machine often effect the "count" copy projection. Adjusting means for varying the timing of the flipper movement while the machine is running have hitherto been employed, but constant changing and adjusting of the flipper mechanism, such as in the case of machines used to produce two or more publications having different numbers of copies in each count, is troublesome and results in considerable delay.

In accordance with the invention a counting mechanism for printing and like machines comprises a pocket for receiving an edge portion of selected copies carried by the fly, and means for actuating said pocket to deposit each selected copy on the conveyor in the desired projected position in relation to preceding copies and for returning said pocket, out of the path of following copies on the fly, to receive the next selected copy.

The pocket is preferably located at the free end of an arm which is pivotally mounted at its other end in such a manner that, during operation, the movement of the pocket follows a substantially square or rectangular path which is in a plane transversely of the fly. This movement, which may be produced by synchronised cam action, causes the pocket to move downwardly in timed relation to the speed of the fly to remove a selected or "count" copy therefrom, then laterally outwardly to release said copy and allow the same to drop on to the conveyor, then upwardly over a path which enables it to clear the edges of the following copies on the fly and finally inwardly in readiness to receive the next "count" copy. A guard plate having an aperture through which the pocket projects and of such dimensions as to enable the pocket to execute its upward and downward movements, may be provided adjacent the side of the conveyor to prevent the copies on said conveyor from moving laterally as the pocket is swung aside.

The provision of a single flipper arm adjacent

3

one side of the conveyor will in known manner cause the "count" copies to be angularly inclined on the conveyor. If desired, two such arms may be provided, one at either side of the conveyor, so that the leading edge of each "count" copy deposited on the conveyor is normal to the direction of travel of the conveyor.

Referring now to the drawings, a rotary or S fly of conventional form and comprising a plurality of coaxially aligned, spaced rotatable discs 10 each carrying a number of angular spaced arcuate blades 11 on its periphery is located above the upper run of endless conveyor bands 12 on which the copies *x* are deposited by the fly for transfer to, for example, a stacker (not shown), the conveyor at one end passing around pulley drums 13 on a drive shaft 14. The fly is driven from the press at the required speed to receive the copies fed thereto from the folding and severing mechanism and to deposit said copies on the conveyor in overlapping relationship, as shown in Fig. 2, and with their folded edges on the conveyor, each almost completely overlying the preceding copy. The copies are normally deposited on the conveyor with their folded and cut edges normal to the direction of travel of the conveyor and for this purpose the folded edges of the copies on the fly are engaged by a pair of fixed stops 15 shown diagrammatically in the drawings and arranged one at or towards either side of the fly. Thus, as the fly rotates in the direction indicated by the arrow in Figs. 1 and 2, the copies are successively stripped therefrom by the stops 15 and deposited on the conveyor.

For the purpose of counting the copies on the conveyor, it is usual to position selected copies, for example, the last copy of each quire, in such manner that they can readily be seen by the pressman, such selected copies being given an overlap, for example, between two and six inches, greater than that of the other copies on the conveyor. This positioning of selected or "count" copies is effected, in accordance with the invention, by means of a movable pocket, of which there may be one at either side of the fly, for receiving the folded leading edge of each "count" copy and movable downwardly, in timed relation with the rotation of the fly, to strip the "count" copy from the fly and deposit it on the conveyor in the required position, thereafter returning to an elevated position in readiness to receive the next "count" copy. The pocket and its supporting flipper are so constructed and actuated that during the downward movement and until the pocket has released the "count" copy, following copies on the fly will be unaffected by the flipper and will be stripped from the fly by the fixed stops 15 in the normal manner; while during its upward or return movement the pocket and flipper will remain clear of the copies on the fly until the next "count" copy is in position thereon.

As embodied, each flipper comprises an arm 20 to one end of which is secured a substantially U-shaped pocket 21 extending inwardly towards the adjacent outer fly disc 10. Each arm 20 is attached, as by means of a pin 22, to a bracket 23 secured to a rock shaft 24 arranged parallel to the axis of the fly and mounted in bearings in the side press frame members 25, one of which is shown in Fig. 4. Also secured to the shaft 24 is a lever 26 which carries at its free end a follower roller 27 riding on a cam disc 28 secured for rotation with the conveyor pulley drum shaft 14. Rotation of the cam disc thus produces rock-

4

ing movement of the shaft 24 and thereby raising and lowering of the flipper arms 20.

The flipper arms 20 are also arranged for lateral movement between an inner operative position and an outer inoperative position and to this end the arms are loosely mounted about the pins 22. This lateral movement of the flippers is controlled by cam rails 29 secured within an annular recess 30 formed in the inner side face of the cam disc 28, said cam rails co-operating with a follower roller 31 mounted in the bifurcated end 32 of a rod 33 which is arranged parallel to the shaft 24 and is supported for axial movement within the brackets 23. Secured to the rod 33 are two links 34 each of which has a pin-and-slot connection at 35 with one of the flipper arms and it will be evident that as the rod is moved axially by the cam rails 29 and follower roller 31, the flipper arms will be rocked about the pins 22. The links 34, as will be seen from Fig. 4, are oppositely arranged about the rod 33 to cause the flippers to move laterally inwardly and outwardly in unison. A spring 36 coiled about the rod 33 and located between one of the brackets 23 and a collar 37 pinned to the rod serves to maintain the roller in engagement with the cam rail.

Fig. 3 shows the approximately rectangular path of movement of each of the pockets 21 during a complete cycle of operation of the counting mechanism. When the pockets first engage the selected or "count" copy the flippers are located as shown in Fig. 1 which corresponds to the full line position in Fig. 3, a little below their uppermost position indicated in Fig. 3 at I, and their operation is so controlled by the peripheral edge of the cam disc 28 and the follower roller 27 that they are caused to move downwardly towards the conveyor 12 in synchronism with the rotary movement of the fly. During the first part of this downward movement of the flippers the leading edge of the "count" copy on the fly enters the pockets 21. The rotational movement of the fly then causes this copy to be stripped from between the supporting fly blades, after which the flippers, continuing their downward movement, reach a position where the pockets engage or are adjacent to the top copy on the conveyor, as shown in Fig. 2. It will be seen that in this position the overlap of the "count" copy, indicated in Fig. 2 at *y*, is considerably in excess of that of the other copies on the conveyor bands and that its folded edge is out of contact with the conveyor.

In order to release the "count" copy from the pockets 21, the flipper arms, on reaching the position shown in Fig. 2, which corresponds to position II of Fig. 3, are caused to move laterally outwardly to position III (broken-line position in Fig. 4) by means of the cam rail 29, rod 33 and links 34. The flipper arms are then given a vertically upward movement, the inner edges of the pockets clearing the side edges of the copies then on the fly, to position IV (Fig. 3), this movement being effected by the peripheral edge of the cam disc 28 and follower roller 27. Thereafter the flippers are moved laterally inwardly until they reach their uppermost inward position, by which time the copies in the following count, for example, a quire, have been fed by the fly to the conveyor and the next "count" copy is in position on the fly to be engaged within the flipper pockets as the latter move downwardly. The cycle of operations as above described is then repeated.

Actuation of the flipper arms during the latter part of their downward movement is such as to position the flipper pockets out of the path of the next following copy on the fly, but it is not essential that this movement and the following laterally outward movement be carried out at a speed such that the said following copy does not contact said arms. The particular construction of flipper according to this invention is, in fact, such that the first one or two copies following a "count" copy may be supported by the flippers adjacent their side edges until said flippers have released the "count" copy, this arrangement allowing for much less critical timing in the operation of the flippers than has been possible with previous constructions. The sides or jaws of the pockets may, as shown, be of unequal length, the longer upper jaw ensuring that the copy immediately following the "count" copy is not engaged within the pocket and the shorter lower jaw facilitating the depositing of the "count" copy on the conveyor.

During the laterally outward movement of the flipper arms, the uppermost copy or copies on the conveyor, the "count" copy and the following copy or copies which are supported on the upper faces of the flipper arms are prevented from moving laterally of the conveyor as by means of guide plates 40 secured to the press frame and located adjacent the side edges of the conveyor. These guide plates are formed with elongated slots 41 through which the pockets 21 project, as is clearly shown in Fig. 4, when the flipper arms are in their laterally inward position.

One of the flipper arms of the embodiment described above may be dispensed with, in which case one end of the leading edge of the "count" copy will enter the single pocket provided and the other end will be arrested by the fixed stop 15 at the opposite side of the fly. With this arrangement the "count" copy will be deposited on the conveyor in an angularly offset position relative to the other copies thereon.

In the arrangement illustrated the cam 28 is constructed to produce two complete cycles of movement of the flipper arms for each complete rotation of the pulley drum shaft 14, being provided with a pair of diametrically opposite cam rails 29 and having its periphery formed with two diametrically opposite corresponding flats producing the downward food movement of the pockets. Any other convenient cam arrangement may, however, be employed.

From the foregoing detailed description of one embodiment thereof, the invention will be seen to provide positive control of the "count" copy due to the use of flipper pockets; considerably reduced sensitivity of timing and setting, the movement of the flipper being slower than in known mechanisms of this kind, since it does not have to avoid contact with other copies leaving the fly; identical projection of successive "count" copies at all press speeds; and the possibility of setting the flippers mechanically prior to printing. Complicated mechanism such as has hitherto been necessary for adjusting the timing is unnecessary, while the provision of side guide plates prevents lateral displacement of the copies on the conveyor as a result of the outward movement of the flippers to release the "count" copy.

What I claim and desire to secure by Letters Patent in the United States is:

1. In a delivery apparatus for papers movable downwardly in timed relation, the combination of a receiver, delivery means serving normally to

deposit the papers in regularly piled arrangement on said receiver, a rock shaft, a pair of arms arranged at opposite sides of the path of travel of the papers and movable upwardly and downwardly by the shaft and pivoted to the shaft to swing laterally inwardly and outwardly, said arms having pockets to receive in the uppermost and inward lateral positions of the arms a leading edge portion of a selected paper and to carry said paper downwardly into changed position on said receiver as compared with the position at which the other papers are deposited on said receiver, a laterally sliding rod, links coupling the same to the arms to swing the arms laterally, and a cam device operative on the shaft and rod for moving said arms downwardly to remove said selected paper from the delivery means, then moving the arms laterally outward to release said selected paper from the pockets and deposit it on the receiver and to bring the arms laterally clear of the previously deposited copies, and then moving the arms upwardly and laterally inwardly to receive leading edge portions of the next selected paper being delivered by the delivery means.

2. In a delivery apparatus for papers movable downwardly in timed relation, the combination of a receiver, delivery means serving normally to deposit the papers in regularly piled arrangement on said receiver, a rock shaft, a pair of arms arranged at opposite sides of the path of travel of the paper and movable upwardly and downwardly by the shaft, said arms being pivoted to the shaft to rock therewith and to swing laterally inwardly and outwardly and having pockets to receive in their uppermost and inward lateral positions leading edge portions of a selected paper and to carry said paper downwardly into changed position on said receiver as compared with the position at which the other papers are deposited on said receiver, a laterally sliding rod, links coupling the arms to the rod for lateral swinging movements, a cam device acting on said shaft and rod for moving said arms downwardly to remove said copy selected paper from the delivery means, then moving the arms laterally outward to release said selected paper from the pockets and deposit it on the receiver, then moving the arms laterally clear of the previously deposited papers, and then moving the arms upwardly and laterally inwardly to receive leading edge portions of the next selected paper being delivered by the delivery means, and guide plates at opposite sides of the path of travel of the papers, said plates being apertured to receive the pockets and to permit upward and downward and lateral movements thereof.

3. In a delivery apparatus for papers movable downwardly in timed relation, the combination of a receiver, delivery means serving normally to deposit the papers in regularly piled arrangement on a receiver, a rock shaft, a pair of arms movable upwardly and downwardly by the shaft and pivoted to the shaft for inward and outward lateral movements relative to the path of travel of the papers, said arms having laterally extending pockets to receive in their uppermost and inward lateral positions leading edge portions of a selected paper and to carry the paper downwardly into changed position on said receiver as compared with the position at which the other papers are deposited on said receiver, a sliding rod arranged parallelly with the shaft, links coupling the arms to the rod to move arms laterally, said shaft and rod having end portions arranged adjacent to each other at one side of the apparatus, and a

7

single cam operating on said adjacent end portions of the shaft and rod for moving said arms downwardly to remove said selected paper from the delivery means, then laterally outward to release said selected paper from the pocket and deposit it on the receiver, then moving the arms

8

laterally clear of the previously deposited papers, and then moving the arms upwardly and laterally inward to receive a leading edge portion of the next selected paper being delivered by the delivery means.

WILLIAM ARNOLD WHITEHEAD.