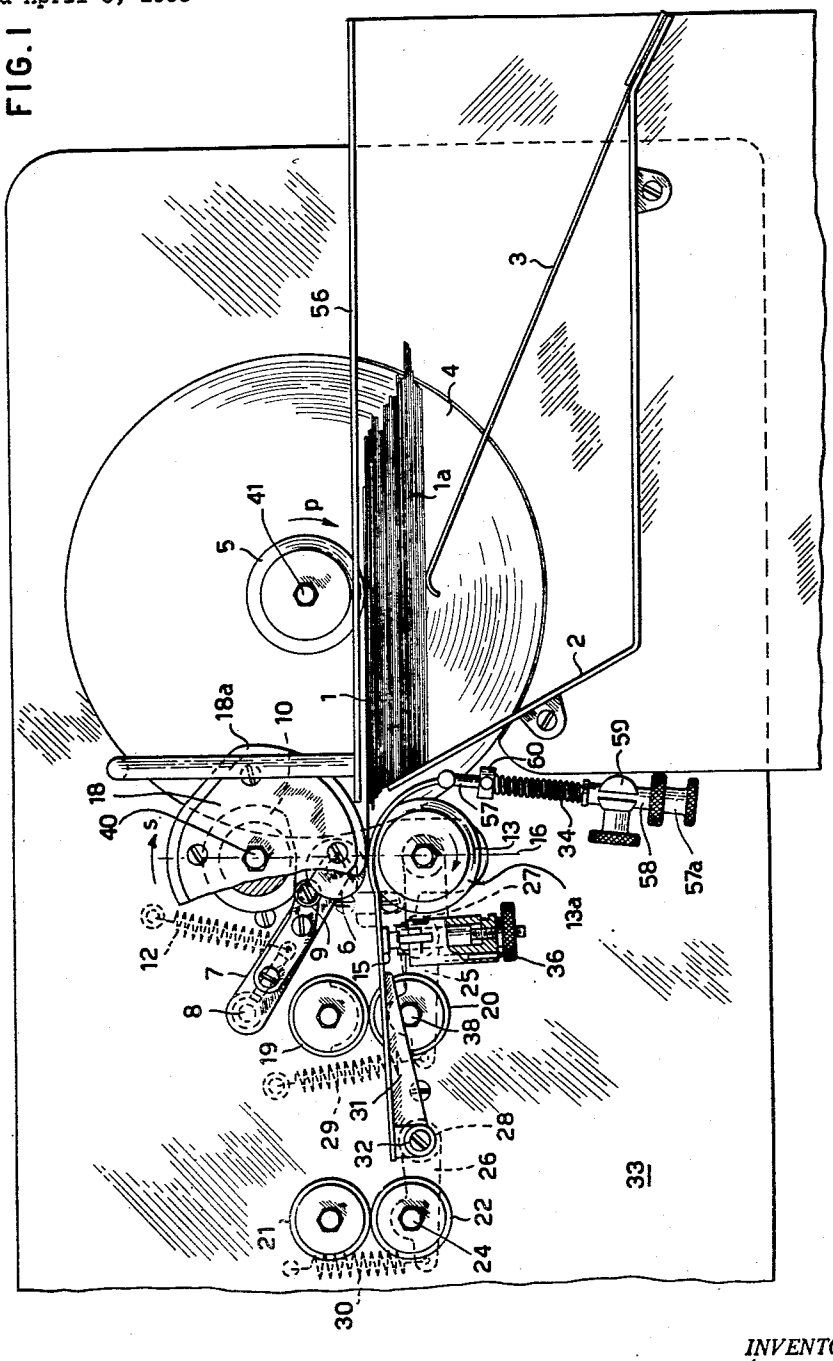
May 27, 1958 F. VAN MARLE 2,836,416

FEEDER FOR MAIL PIECES

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FIG. 1



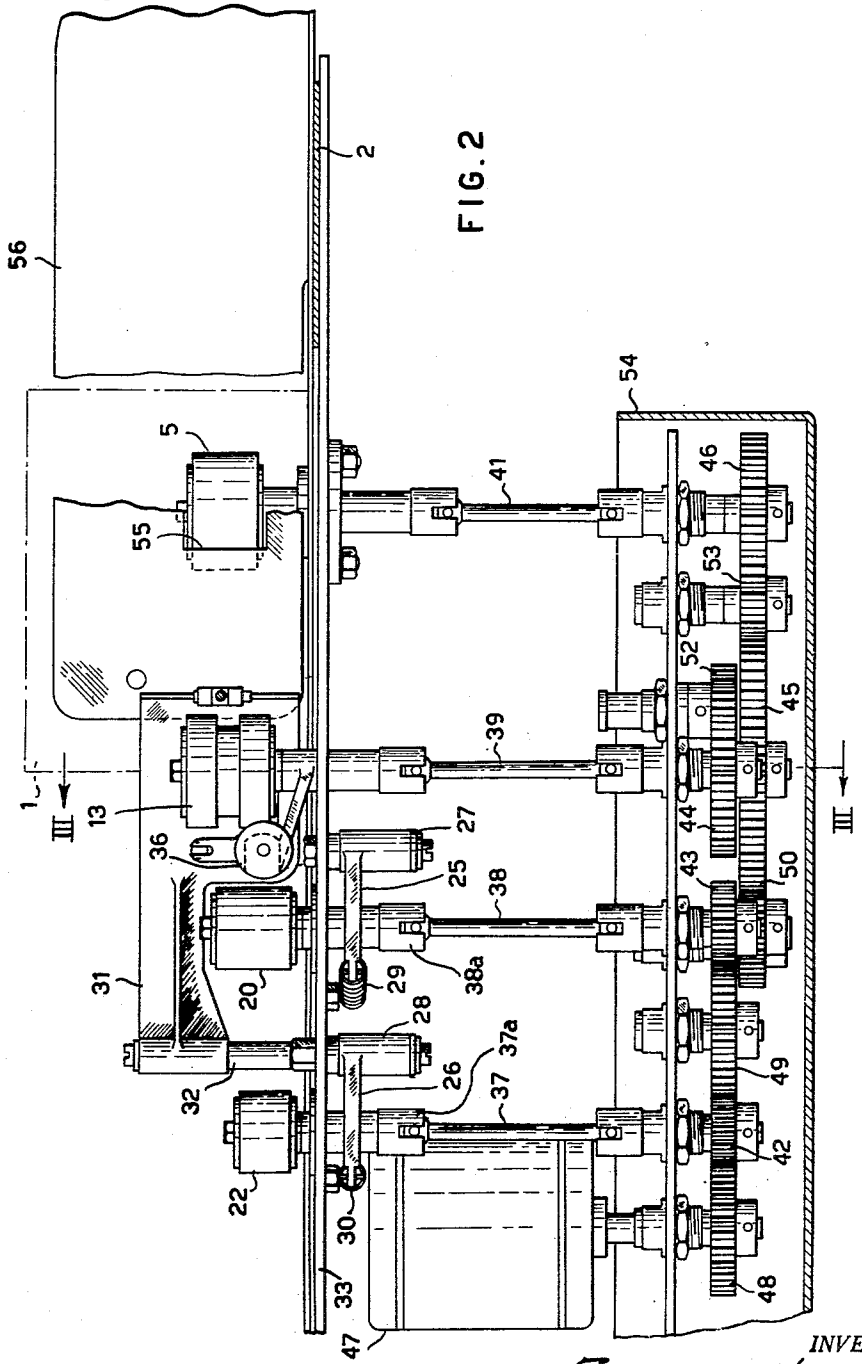

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FEEDER FOR MAIL PIECES

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FIG. 2



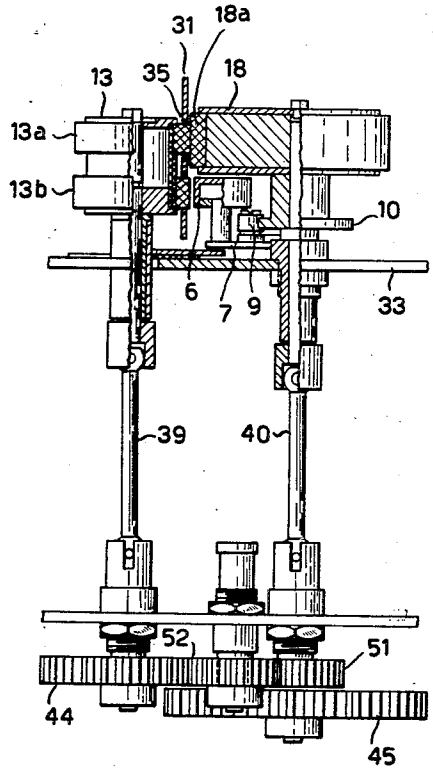

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FIG. 3




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FIG. 4

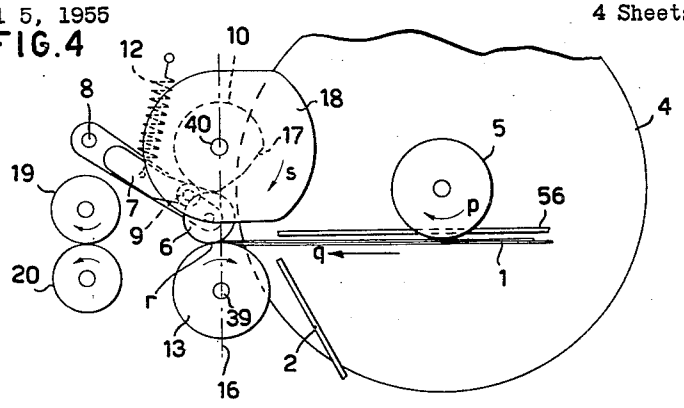



FIG. 5

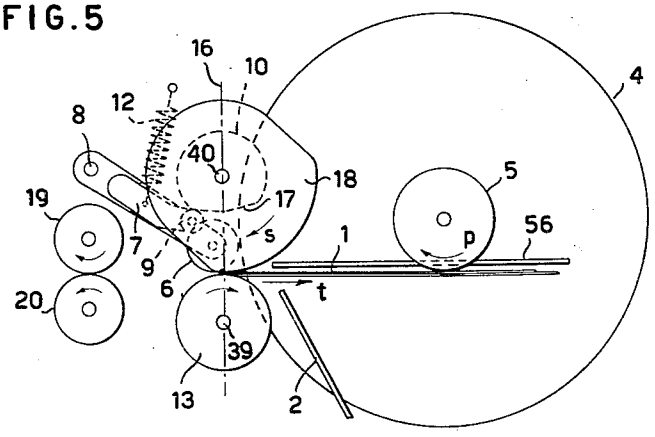
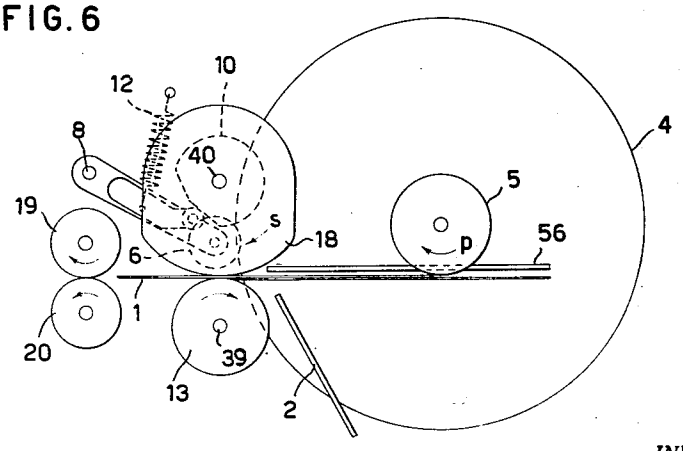



FIG. 6




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United States Patent Office

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# FEEDER FOR MAIL PIECES

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Application April 5, 1955, Serial No. 499,483

11 Claims. (Cl. 271—39)

This invention relates to a machine feeder for mail pieces, the principal object being to provide a machine upon which mail pieces such as letters, post cards and the like, may be stacked and which will then feed them one at a time with a constant center distance on their further path, in rapid succession, to a facing machine, a cancelling machine or to a sorting machine.

The principal difficulties with presently known machines lies in their inability to feed the pieces singly and such that on their further path from the feeder they will be at constant center distance and so far from each other that the time between the feed operations of successive mail pieces may be used for purposes such as the operation of gates in a sorting machine to direct the successive mail pieces to different sorting compartments or magazines. Where numerous doubles go through, for instance, to a cancelling machine, many pieces are uncancelled and if the feeder is attached to a facing or sorting machine, the fed machine may become jammed, also when the mail pieces follow each other too closely. Furthermore, present machines are rather complicated so that they require considerable maintenance.

Another object of this invention is to provide a feeder of relatively few parts, all of sturdy construction, to provide safeguards in the nature of resilient mountings for parts which may be subjected to severe strains and to provide certain guards or shields, manually adjustable, all in the interests of prolonged uninterrupted operation.

Other objects and advantages will become more fully apparent as reference is had to the accompanying drawings wherein my invention is illustrated, by way of example and in which

Figure 1 is a top plan view of my improved feeder,

Figure 2 is a side elevation of the feeder as shown in Figure 1 with a portion of a platform wall removed and with a side wall of the oil pan in section to show the gearing,

Figure 3 is a transverse vertical section taken along the line 3—3 of Figure 2,

Figure 4 is a diagrammatic top plan view showing two mail pieces after their first forward movement and now in halted position,

Figure 5 is a view similar to Figure 4 showing the stop or halting means removed from in front of the mail pieces with a cam transporting means beginning to transport one of the pieces.

Figure 6 is a view similar to Figures 4 and 5, showing one of the pieces being transported, while the other one is restrained from movement.

More particularly, a stack of mail pieces 1, 1*a*, is placed in a container 2, having an elongated spring finger 3 to press the pieces against a wall 56. A revolving platform or turn-table 4, mounted on a shaft 41 and rotated in the direction of the arrow *p*, constitutes a portion of the bottom of the container 2 and is, in fact, the portion upon which the letters ready to be fed are placed. Rotation of the platform urges the leading edges of the letters against the wall 56.



Mounted on the shaft 41 for rotation therewith and immediately above the platform is a friction roller 5. The wall 56 has an opening 55 (Figure 2) therethrough through which a portion of the periphery of the roller 5 projects. Rotation of the roller 5 impels or transports the mail piece 1 immediately adjacent the wall 56 in a direction to the left (Figure 1) parallel to the wall. There is oftentimes sufficient friction between the impelled mail piece and the adjacent piece to cause more than one piece to move forward at one time, as is illustrated in Figures 4, 5 and 6.

The mail piece or pieces 1 proceed until they are halted by a stop means formed by the contact of an idler roller 6 with a friction surface 13*b* of a driven roller 13, the line of contact of these two rollers being directly in the path of the leading edge of the mail piece 1, as best shown in Figures 1 and 3.

The idler roller 6 is mounted for free rotation on an arm 7 which is pivotally mounted at 8 on the frame top 33. Also mounted on the arm 7 is a cam follower 9 which is held in pressure contact with a driven cam 10 mounted on a shaft 40, the follower being pressed against the cam by a spring 12 anchored at one end to the arm 7 and at its other end to the frame top 33.

The roller 13 is herewith shown (Figure 3) as a single roller mounted on a driven shaft 39 for rotation therewith and having two spaced friction surfaces 13*a* and 13*b*. It may be considered as two co-axial rollers, one of which, 13*b*, is intermittently contacted by the idler 6 while the other roller 13*a*, intermittently coacts with a cam 18. The cam 18 may be considered as a roller with a portion of its periphery removed. The cam is mounted on the shaft 40 for rotation therewith. This cam has a friction surface 18*a* which is wider than the friction surface 13*a* and is so positioned that during its rotation, which is at a substantially higher speed than that of the roller 13, it will contact a mail piece 1, whereupon it presses it against the friction surface 13*a* causing the mail piece to resume its travel, as will be further hereinafter described. It is to be noted, at this point, that the plane 16 containing the axes of the shafts 39 and 40, is in rear of the line of contact of the roller surface 13*b* with its idler 6. The purpose of this is to cause the cam 18 to contact each mail piece 1 along a surface rearwardly of its leading edge.

In order to keep the contact point between idler 6 and roller surface 13*b* in line with the direction of feed of the mail piece 1, notwithstanding the fact that said contact point is in front of said plane 16, the diameter of surface 13*b* is slightly greater than that of surface 13*a*.

The operation will now be described with particular reference to Figures 3, 4, 5 and 6. Assume that the roller 5 has impelled two mail pieces 1. The idler 6 is in contact with the surface 13*b* by reason of the follower 9 riding the high part of the cam 10, causing both pieces 1 to halt their progress. The roller surfaces 13*a* and 13*b*, both of which are reversely rotating, are in contact with the mail piece 1 remote from the wall 56. They therefore cause this piece to move rearwardly even though the leading edge of this piece may have arrived first at the line of contact of the idler 6 and surface 13*b*.

As the follower 9 rides on to the low part 17 of the cam 10, the cam 18 contacts the mail piece 1 adjacent thereto, thus pressing both mail pieces against the surface 13*a* while the surface 13*b* still freely contacts the mail piece 1 adjacent thereto. By reason of the friction of the cam 18 with the piece adjacent thereto, this piece is impelled in its original direction of movement and thereupon fed between the rollers 19 and 20. The mail piece adjacent the rollers 13*a* and 13*b*, meanwhile, is held against forward movement because of the reverse rotation of these rollers. When the cam 18 has left

contact with the mail piece which it is transporting the idler 6 immediately again contacts the surface 13*b* thus blocking travel of the remaining mail piece until the cam 18 completes its revolution and thereupon makes contact with it.

Now, suppose that there is only one mail piece 1 in the showings of Figures 4, 5 and 6. In this case the piece is halted by the contact of the idler 6 and the roller surface 13*b*. It is in free contact with the roller surface 13*b*. The idler moves out of contact with the surface 13*b* as the cam 18 presses the mail piece against the surface 13*a*. The surface 13*a* is rotating in a direction opposite to the rotation of the cam 18 but since the cam 18 is rotating at a substantially higher speed than the roller 13 and since the friction surface 18*a* of the cam 18 is substantially wider than the surface 13*a* the mail piece is transported by the cam to the rollers 19 and 20 and by these rollers to the rollers 21 and 22.

Thus it is clear that the described feeding device always feeds single mail pieces which will be at a constant center distance. This is very important because the time between the feeding of successive mail pieces may be used, e. g. for operating gates in the further path of the mail pieces such as to direct same to different places.

The roller 13 is provided with a shield 31 having windows 35 (Figure 3) through which a portion of the periphery of the roller surfaces 13*a* and 13*b* project. This shield is pivotally anchored to the frame top 33 at 32 and is anchored at its other end to a rod 57 which can slide in a sleeve 58 threaded in a bracket 59 mounted on the frame top 33. The rod 57 has at one end a knob 57*a* and an adjustable collar 60 at the other end and a spring 34 therearound which urges the collar 60 and the sleeve 58 apart. Rotation of the end of the sleeve 58 changes the position of the shield 31 with respect to the cam surfaces 18*a*. The amount of the periphery of the rollers 13*a* and 13*b* exposed through the window of the shield may be altered by the rotation of the knurled screw 36 mounted on the abutment 15 fixed on the rear of the shield 31.

With attention now to Figures 2 and 3 it will be seen that all rollers and shafts are driven in timed relation by a motor 47 residing below the top 33. The rollers 22, 20, 13, 18 and 5 are mounted for rotation respectively on shafts 37, 38, 39, 40 and 41 and these shafts, in turn have the gears 42, 43, 44, 51 and 46 respectively carried by their lower ends. These gears are driven through intermediate gearing 48, 49, 50, 52 and 53 by the motor 47. The gears all run in a casing 55 which should be kept partially filled with oil.

The shaft 37 is flexible and extends through a bushing 37*a*. This bushing is integral with an arm 26 pivotally mounted at one end 28 on the shaft 32 secured to the frame top 33, the outer end of the arm being pressed by a spring 30 which urges the roller 22 against the roller 21. The rollers may adjust themselves to any necessary position depending upon the thickness of a mail piece. Similarly the shaft 38 is flexible, the upper portion extending through a bushing 38*a*. The arm 25 is integral with this bushing and is anchored at one end 27 to a pin carried by the frame top 33 while the other end of this arm is pressed by the spring 29 which urges the roller 20 against the roller 19.

What I claim is:

1. A feeder for mail pieces comprising a platform having a vertical wall against which mail pieces are stacked, a friction device operable directly upon the mail piece adjacent said wall transporting it in a direction parallel to said wall, stop means in the path of said piece momentarily halting its progress, a driven friction roller immediately above said stop means rotating in a direction opposite to the direction of travel of said piece and with which said piece has free contact when halted, a second driven roller having a portion of its periphery removed to form a cam, said cam having its periphery made of friction material of greater width than the width of the first named roller and rotating in opposite direction thereto, said cam during its rotation finding contact with the halted mail piece and pressing said piece against the first roller thereby causing a resumption of the movement of said mail piece, and timed means removing said stop means from the path of said mail piece as contact of said piece by said cam occurs, said timed means moving said stop means into the path of the next on-coming mail piece with loss of contact of the first named mail piece by said cam.

2. The combination as set forth in claim 1 wherein said stop means halts the leading edge of said mail in advance of a plane containing the axes of the first named friction roller and the shaft of said cam whereby said cam makes contact with said mail piece in rear of the leading edge thereof.

3. A feeder for mail pieces comprising a platform having a vertical wall against which mail pieces are stacked, a first driven friction roller partially projecting through said wall transporting one and sometimes more than one mail piece next adjacent said wall in a direction parallel thereto, stop means in the path of said piece or pieces halting the progress thereof, a second driven friction roller immediately above said stop means rotating in a direction opposite to the direction of travel of said piece or pieces and against which one of said pieces has free contact, a third driven friction roller having a portion of the periphery thereof removed thereby forming a cam, said third roller rotating in a direction opposite to that of said second roller and at higher speed, said cam having greater width than the friction surface of said second roller, said cam during its rotation finding contact with a side of a halted mail piece and pressing it against said second roller thereby causing said mail piece to resume its direction of travel, said second roller by its reverse rotation opposing movement of a chance second mail piece while said cam causes movement of the mail piece in contact therewith, means removing said stop means from the path of the mail piece being transported by action of said cam, and means returning said stop means into the path of the next oncoming mail piece immediately after loss of contact of said cam with the mail piece actuated thereby.

4. The combination as set forth in claim 3 wherein said second roller has a shield therearound, said shield having a window through which a portion of the periphery thereof projects, said shield being manually adjustable to vary the length of the arc of said second roller which is exposed to contact with a mail piece.

5. A feeder for mail pieces comprising a platform having a vertical wall against which mail pieces are stacked, a first driven friction roller projecting partially through said wall transporting the mail piece adjacent thereto in a direction parallel to said wall, stop means momentarily halting the progress of said mail piece comprising a second driven friction roller rotating in a direction reversely to the direction of progress of said piece and an idler roller in contact therewith, said second roller and said idler having a line of contact in the path of said mail piece, timed friction means contacting said mail piece when halted, causing it to resume its original direction of progress, said timed means making contact with said piece along a surface thereof rearwardly of the line of contact of said second roller and its idler, and means removing said idler from contact with said second roller as contact of said timed means with said mail piece occurs, said means moving said idler back into contact with said second roller immediately after loss of contact of said mail piece with said second roller.

6. A feeder for mail pieces comprising a platform having a vertical wall against which mail pieces are placed, a friction device operable directly against the mail piece adjacent said wall for moving the mail piece parallel

thereto, means momentarily halting the progress of said piece comprising a roller driven in reverse direction to the direction of progress of said piece and an idler roller in contact therewith, a third roller co-axial with said driven roller and out of contact with said idler roller with which said mail piece freely contacts while halted, and a fourth roller having a portion of its periphery removed to form a cam portion to press said halted mail piece against said third roller thereby transporting said mail piece in its original direction of travel, and means removing said idler roller from contact with said first named roller immediately upon contact of said cam portion with said mail piece, said means returning said idler to contact with said first named roller immediately upon loss of contact of said mail piece by said first roller.

7. A feeder for mail pieces comprising a platform having a vertical wall, a friction device directly contacting the piece adjacent said wall thereby transporting it in a direction parallel to the wall, means halting the travel of said piece comprising a first roller driven reversely to the direction of travel of said piece and an idler roller in contact therewith, a third driven roller co-axial with said first roller rotating therewith against which said piece freely rests while said piece is halted, a fourth roller having a portion of its periphery removed to form a cam, means rotating said fourth roller in a direction opposite that of said first and third rollers, said cam during its rotation contacting the halted mail piece and pressing it against said third roller, said third roller having less area of contact with said piece than does said cam portion and said cam rotating at higher speed than said third roller, said cam causing said piece to continue its original direction of travel, and means removing said idler roller from contact with said second roller immediately upon contact of said cam with said piece.

8. A feeder for mail pieces comprising a platform having a vertical wall, a friction device directly contacting the piece adjacent said wall thereby transporting it in a direction parallel to the wall, means halting the travel of said piece comprising a first roller driven reversely to the direction of travel of said piece and an idler roller in contact therewith, a third driven roller co-axial with said first roller rotating therewith against which said piece freely rests while said piece is halted, a shield for said first and third rollers having windows through which a portion of the periphery of each thereof projects, means for adjusting the position of said shield with respect to said rollers whereby the length of periphery of said rollers exposed through said windows may be varied, a fourth roller having a portion of its periphery removed to form a cam, means rotating said fourth roller in a direction opposite that of said first and third rollers, said cam during its rotation contacting the halted mail piece and pressing it against said third roller, said third roller having less area of contact with said piece than does said cam portion and said cam rotating at higher speed than said third roller, said cam causing said piece to continue its original direction of travel, and means removing said idler roller from contact with said second roller immediately upon contact of said cam with said piece.

9. A feeder for mail pieces comprising a platform having a vertical wall against which mail pieces are placed, a friction device operable directly against the mail piece adjacent said wall for moving the mail piece parallel thereto, means momentarily halting the progress of said piece comprising a roller driven in reverse direction to the direction of progress of said piece and an idler roller in contact therewith, a third roller co-axial with said driven roller and out of contact with said idler roller with which said mail piece freely contacts while halted, and a fourth roller having a portion of its periphery removed to form a cam portion to press said halted mail piece against said third roller thereby transporting said mail piece in its original direction of travel, and means removing said idler roller from contact with said first named roller as contact of said cam portion with said mail piece occurs, said means returning said idler to contact with said first named roller immediately upon loss of contact of said mail piece by said first roller, said first driven roller and said idler roller having a line of contact in advance of a plane containing the axes of said first and third rollers and said fourth roller whereby said cam portion contacts said mail piece rearwardly of its leading edge.



10. A feeder for mail pieces, comprising a platform having a vertical wall against which mail pieces are stacked vertically, spring means maintaining said letters pressed against said wall, said platform comprising a horizontally placed driven turntable which constantly urges the leading portions of said mail pieces toward said vertical wall, a first driven friction roller having a portion of the periphery thereof projecting through said wall and constituting means for transporting the mail piece adjacent said wall in a direction parallel thereto, means momentarily halting each of said mail pieces prior to its loss of contact with said wall, a second friction roller with which said mail piece makes free contact while in halted position, and a third friction roller having a portion of the periphery removed to form a cam, said third friction roller being driven and the cam portion upon pressing said mill piece against said second friction roller causing said mail piece to resume its original direction of travel, said cam portion and said second roller having a line of contact rearwardly of the leading edge of said mail piece when halted.

11. A feeder for mail pieces comprising a rotating platform mounted on a driven shaft, a friction roller mounted on said shaft adjacent said platform, a vertical wall above said platform against which said platform urges said mail pieces, said platform having an opening therethrough through which a portion of the periphery of said roller projects, said roller acting to transport the piece adjacent thereto parallel to said wall, stop means for halting the progress of said piece comprising a second driven friction roller rotating in a direction opposite the direction of travel of said piece and an idler having a line of contact in the path of said piece, a third driven friction roller mounted on the shaft of said second roller for rotation therewith out of contact with said idler, said mail piece contacting said third roller without pressure when in halted position, a fourth driven roller rotating in opposite direction to that of said second and third rollers, said fourth roller having a portion of its periphery removed to form a cam, said cam rotating at substantially higher speed than said second and third rollers and having a frictional surface substantially wider than the friction surface of said third roller, said second roller and its idler having a line of contact forwardly of a plane containing the axes of said third and fourth rollers, said cam during its rotation finding contact with a surface of said mail piece and pressing it against said third roller thereby causing said piece to resume its travel, timed means removing said idler from contact with its roller as said cam contacts said mail piece, and additional driven rollers which continue the transport of said mail piece after it loses contact with said cam, said timed means then moving said idler back into contact with its roller to form a temporary stop for the next oncoming mail piece.

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