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Jackson et al.

[11] **3,905,896**

[45] **Sept. 16, 1975**

[54] **METHOD AND APPARATUS FOR SORTING AND DISTRIBUTING MAIL**

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[52] **U.S. Cl.** **209/124**; 209/DIG. 1

[51] **Int. Cl.** **B07c 7/02**

[58] **Field of Search** 209/DIG. 1, 123, 124; 211/1.5, 131

[56] **References Cited**

UNITED STATES PATENTS

1,204,428	11/1916	Grandfield	209/124
2,553,507	5/1951	Rosenberg	211/131
2,633,970	4/1953	Robinson	209/124
3,002,628	10/1961	Reddell	211/1.5
3,747,752	7/1973	Reader	209/DIG. 1
3,807,788	4/1974	Radek	211/131

FOREIGN PATENTS OR APPLICATIONS

753,547	10/1933	France	209/124

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Assistant Examiner—Thomas E. Kocovsky
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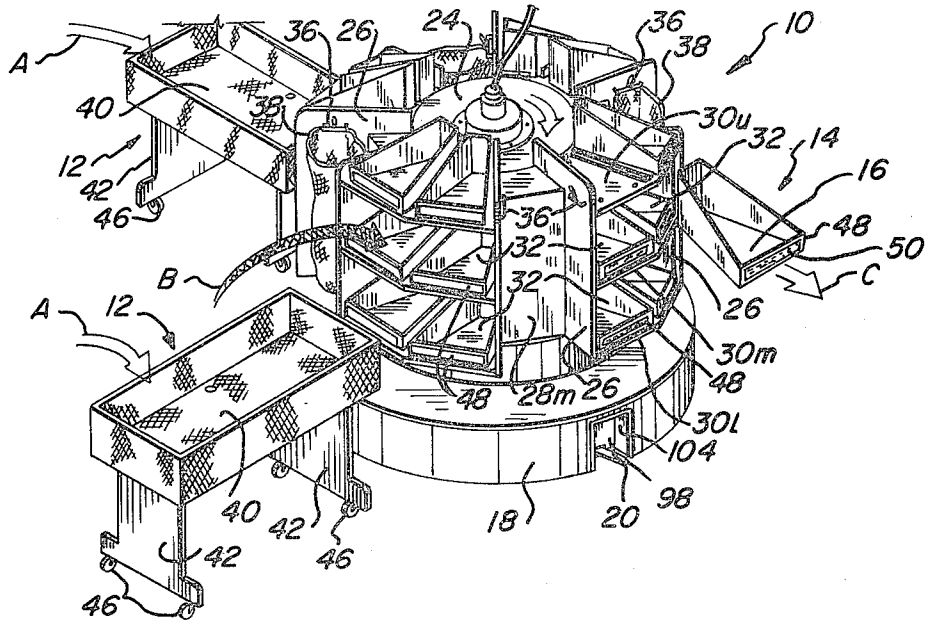
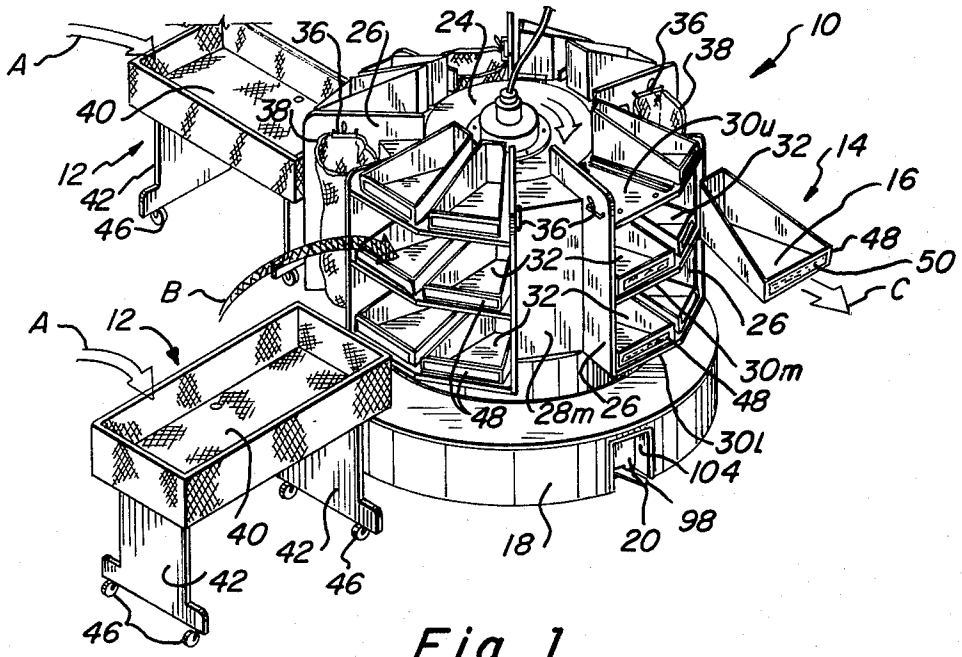
[57] **ABSTRACT**

This invention relates to apparatus for sorting and distributing mail which comprises a centrally-located carousel-like unit that rotates about a vertically-disposed axis during both of the aforesaid operations and around which are grouped one or more stationary receiving stations extending radially therefrom. The carousel unit itself has two or more pigeonholes opening radially outward from a central core that repeatedly and successively circulate past each receiving station and distribution point. Detachably retained within each pigeonhole is an open-fronted drawer-like bin designed for removal and replacement while the unit is still in motion. A novel braking device consisting of a pin spring-biased against an undulating cam carried atop an idler wheel rotated by the carousel cooperates with a friction drive so as to enable the unit to be stopped at will whereupon it will remain stopped until restarted. These same units also cooperate such that, once the unit is in motion, it will remain in motion until stopped due to the fact that the drive mechanism overrides the braking system. The invention also encompasses the method of sorting mail which comprises the steps of receiving a load of mail to be sorted at a stationary receiving station, sorting same according to destination, and placing it thus sorted into selected receptacles repeatedly circulating past the station. The invention further encompasses the distribution method for redistributing the mail thus sorted which consists of removing the mail-receiving receptacles, emptying same and returning the empty receptacles to the circulation system while the latter remains in motion and in use for the mail-sorting function.

22 Claims, 7 Drawing Figures

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C
A
12
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28m
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40
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46
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Fig_1

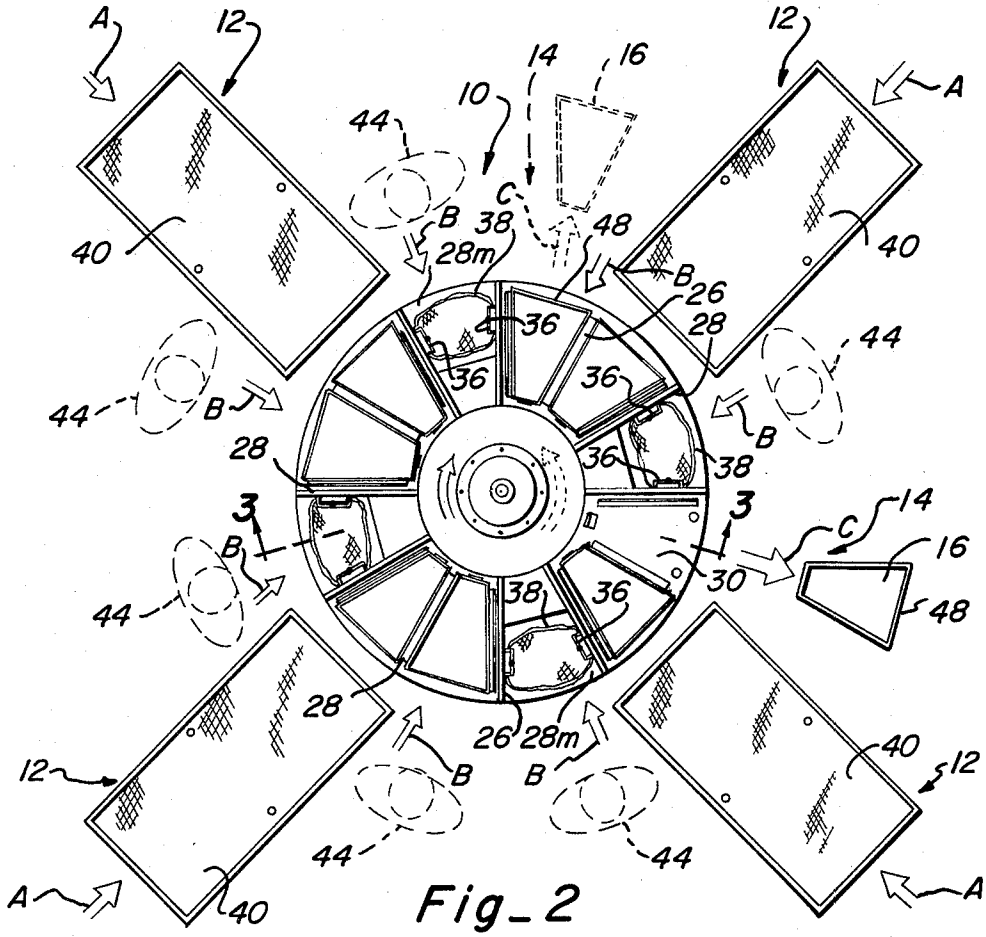
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Fig_2

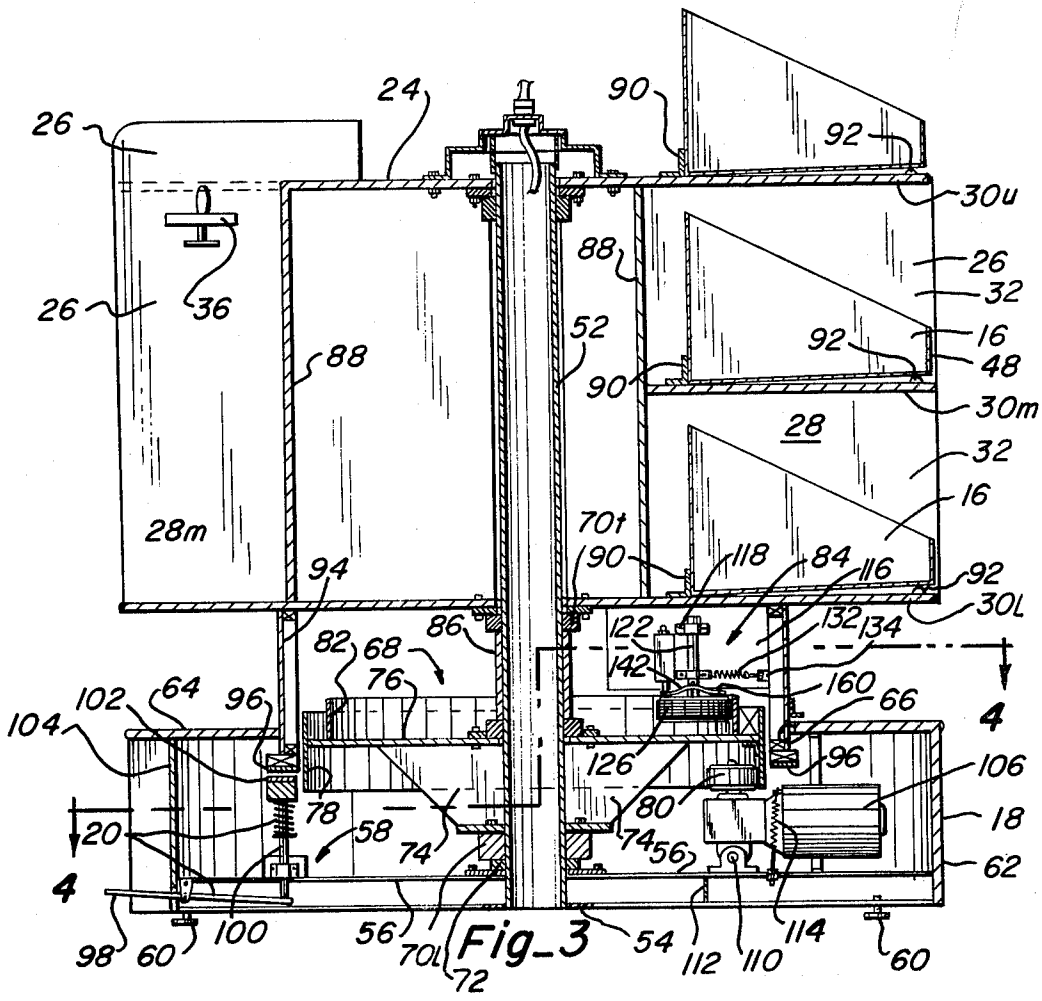
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Fig_3

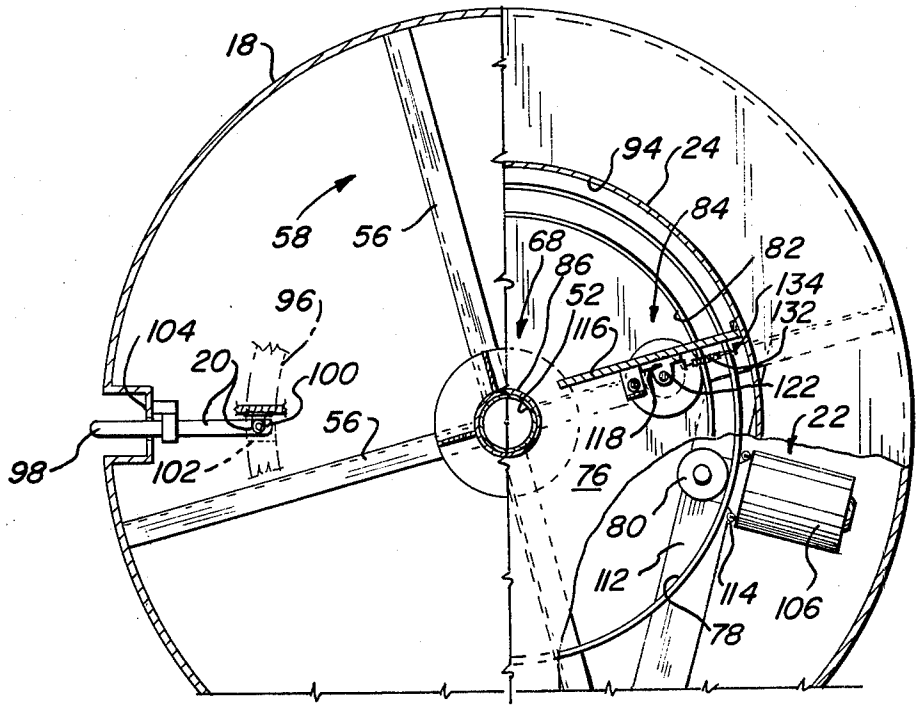
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Fig_4

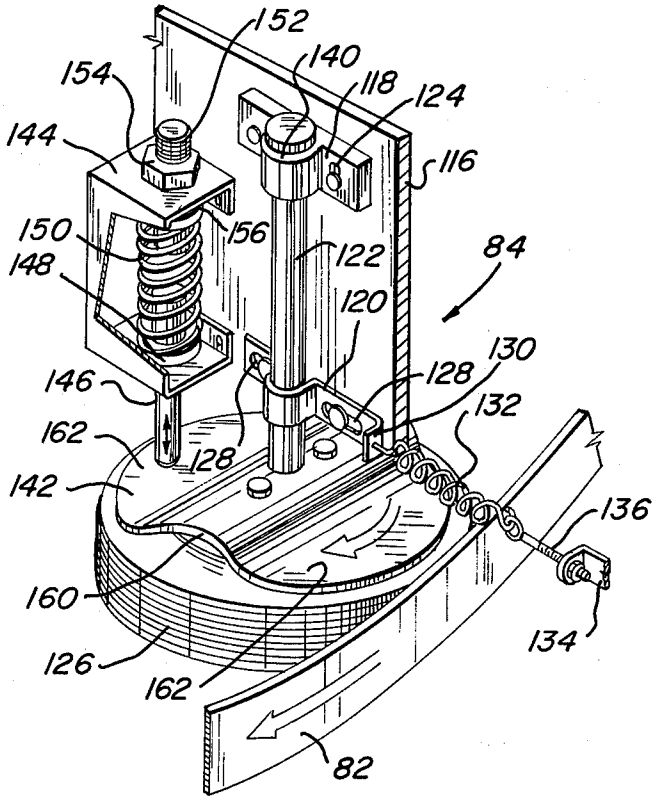

Fig_5

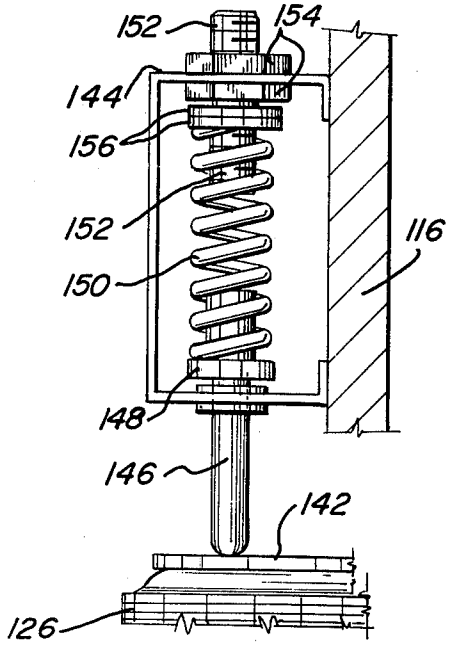

Fig_6

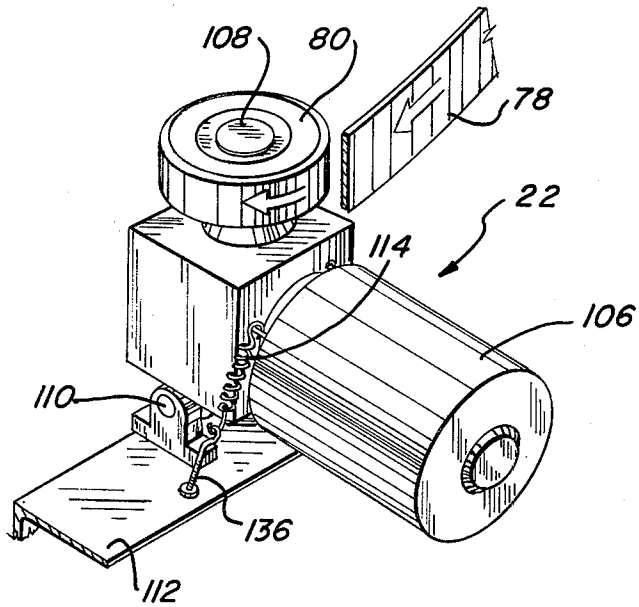

Fig_7

METHOD AND APPARATUS FOR SORTING AND DISTRIBUTING MAIL

Mail sorting according to destination or addressee is a time-consuming and expensive operation which, up to the present time anyway, is performed manually by skilled "sorters". Theoretically, mail can be coded and machine sorted in the same manner as is commonly done with punch cards and the like; however, no practical way has yet been found to locate the code with the machine and read it accurately, especially when handwritten. Also, no machine capable of accommodating all the various different sizes and shapes of mail automatically, or even partially so, has been developed. The net result is that human beings read the address and manually sort the mail in accordance with what they read, all in much the same way that such an operation would have been performed from the time man first learned to read and write and the necessity for sorting his communications first arose.

It has now been found in accordance with the teaching of the instant invention that these and other shortcomings of the traditional methods and equipment for sorting mail can, to a considerable extent at least, be alleviated and speeded up by the simple, yet unobvious, expedient of sorting into a continuously-moving circulating array of drawer-like open-fronted bins contained within radially-disposed pigeonholes. The sorters stand alongside radially-extending, stationary receiving stations where the mail to be sorted is first delivered. Several such stations can be located around the periphery of the centrally-located carousel resulting in a considerable saving in floor space. Also, if necessary, two sorters can work at the same receiving station facing one another on opposite sides thereof.

As the mail is classified by the sorter according to destination, instead of moving to the appropriate pigeonhole as was previously done, he or she merely waits for it to come by and tosses the mail into the waiting bin as it does so. Contrary to established practice, no sorter need move in front of another or otherwise interfere because each person has independent access to every bin for a brief time interval during each revolution when no one else has access thereto.

The mail thus sorted can also be removed from the carousel "on-the-fly" so to speak with minimal interruption to the sorting operation. As a bin becomes full, another operator need only pull the bin from its pigeonhole as it goes past, dump the contents into an awaiting receptacle and be ready to replace it when the pigeonhole comes around again. If, in the interim, a sorter has a piece of mail for the missing bin, he or she need only wait a few seconds at most until the empty bin is back in place and it comes around once again.

In the way of refinements, the bins and their pigeonholes are preferably color coded in matching colors which makes it simple to replace the bin in the right place after it has been emptied. These same bin colors constitute "destination codes" so that the sorter is relieved of the necessity for having to read the address on the bin to distinguish it from other like or similar bins.

Stacking the bins one above the other in tiers materially increases the capacity of the carousel, yet, does not interfere with its utility in the least. It is also possible to leave open spaces between adjacent tiers to accommodate ordinary mail sacks which are detachably retained therein with quick-disconnect fasteners of some type.

Such sacks are ordinarily used for a "rough sort" to separate mail going to another location for final sorting such as, for example, a substation, plant, department or other subdivision. The volume of such mail is likely to be several times that of the individual addressee mail sorted into the bins, hence, the need for greater storage capacity.

As far as the carousel itself is concerned, it includes a number of innovative features, the most significant of which is a brake that sets automatically whenever the unit is stopped and is effective to hold it stationary under the influence of the starting torque developed by the friction drive all by itself. While the elements of the brake do not disengage and release in the sense of the conventional braking system, they can be overridden upon the application of an additional rotational force, the minimum magnitude of which is different depending upon whether such force supplements or counteracts that of the friction drive. Once rotating in the direction driven by the friction drive, however, the inertia of the unit is such that it will keep on rotating and the brake alone is ineffective to stop it.

The drive mechanism is a variation of a conventional Rockwood drive wherein a condition of imbalance is relied upon to bias a drive element into driving engagement with a driven element while, at the same time, automatically compensating for any wear developing therebetween. While no novelty is predicated upon the drive itself, there is a unique cooperative relation between it and the automatic braking system wherein the drive assumes the dominant or controlling position with the unit in motion in the driven direction and, conversely, the brake overrides the drive and maintains the unit in a stationary condition whenever it is stopped.

Accordingly, it is the principal object of the present invention to provide a novel and improved mail-sorting apparatus which includes as its central unit a rotating carousel equipped with removable mail-receiving bins disposed within pigeonholes.

A second, but equally important, objective is the provision of an improved mail-sorting method wherein the mail is manually sorted "on-the-fly" into receptacles therefor circulating continuously past a stationary-receiving station.

Another object of the within-described invention is to provide the central carousel unit with a unique automatic braking system operative, once the unit is stopped, to override the friction drive and prevent further rotation thereof.

Still another objective is the provision of a friction drive cooperating with an automatic friction brake so as to override the latter whenever the unit is in motion in the driven direction.

An additional objective is to provide a novel method of distributing the mail thus sorted and collected which consists of removing the receptacles, emptying the contents thereof and returning the empty bins to their respective pigeonholes, all while the unit remains in motion and in use to perform the sorting function.

Further objects are to provide apparatus and methods of using same of the type aforementioned, all of which are fast, efficient, versatile, easy to use and convenient.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawings that follows, and in which:

FIG. 1 is a perspective view looking down upon the mail-sorting and distributing apparatus from an elevated position;

FIG. 2 is a top plan view of the apparatus to the same scale as FIG. 1;

FIG. 3 is a section taken along line 3—3 of FIG. 2 to a greatly enlarged scale;

FIG. 4 is a section taken along line 4—4 of FIG. 3 to the same scale as the latter, portions having been broken away to conserve space;

FIG. 5 is a fragmentary perspective view to an enlarged scale showing the automatic braking system, portions of which have been broken away and shown in section to more clearly reveal the interior construction;

FIG. 6 is a still further enlarged fragmentary section showing the adjustable pin-type brake shoe; and,

FIG. 7 is a fragmentary perspective view similar to FIG. 5, but to a smaller scale showing the friction drive mechanism.

Referring next to the drawings for a detailed description of the present invention and, initially, to FIGS. 1 and 2 for this purpose, reference numeral 10 has been chosen to broadly represent the centrally-located carousel unit around which are arranged one or more receiving stations that extend outwardly radially therefrom and which have been similarly referred to by reference numeral 12. These receiving stations bear an angularly-spaced relation to one another and in the vacant space therebetween is where the unloading and distribution function is performed, the latter having been broadly designated by reference numeral 14 and represented by the detached bins 16 and associated radial arrows directed outwardly.

The carousel unit 10 has a stationary floor-mounted base 18 which houses the manually-actuated foot brake 20 along with the friction drive mechanism that has been generally referred to by reference numeral 22 and which will be described in detail presently in connection with FIG. 7. Mounted atop the base for rotational movement relative thereto about a vertical axis of rotation is the rotating subassembly 24 into which the mail is sorted from the receiving stations 12.

Rotating subassembly 24 has a plurality of radially-extending partition walls 26 that divide the exterior thereof into generally wedge-shaped compartments 28. Some, but not all of these compartments, include two or more horizontal shelves 30 arranged in vertically-spaced relation one above the other and which function to further subdivide each such compartment into several pigeonholes 32. Removably retained within these pigeonholes 32 are the bins 16 into which the mail from the receiving stations is sorted.

While it is quite possible to subdivide the entire outside surface of the rotating subassembly 24 into bin-receiving pigeonholes and, in fact, it may even be preferable to do so in certain mail-sorting operations, the particular unit shown has some of the partitioned compartments 28M left free of shelves 30. Instead of shelves, the opposed partition walls 26 are provided with quick-disconnect clamps 36 of a type effective to releasably fasten an open mail bag 38 therein. A unit having mail bags 38 in addition to the bins 16 is useful where part of the mail sorted is destined for another sorting station or substation to which it is transported directly in the mail bag without having to first sort it into a bin and then empty the bin into a bag.

The receiving stations 12 comprise open-topped elongate trays 40 having pedestals 42 at opposite ends that raise them up to a level about waist high on the operator or, more specifically, the "sorter" 44. Casters 46 under the pedestals enable the trays to be moved from place to place easily. One caster on each pedestal is preferably of the locking type so that the tray, once positioned relative to the carousel unit, can be locked in place. In FIG. 2, four such receiving stations have been shown grouped around the central carousel in 90° angularly-spaced relation to one another.

The unsorted incoming mail enters the system at the points identified by arrows "A" where it is dumped or otherwise deposited into the receiving station trays 40. The sorters 44 stand alongside the trays as represented diagrammatically in broken lines in FIG. 2. If one sorter per tray is used, it seems to make little difference which side of their tray they work from because any two working without a tray between them will be back-to-back making conversation difficult and, alternatively, those who face one another will do so with two trays and about half the carousel in between so they can barely see, yet, alone converse. With two sorters at each station, they face one another but have the sorting tray in between.

The sorters take the incoming unsorted mail dumped into their tray and sort it according to addressee or destination, whereupon, they toss it into the appropriate bin 16 or mail bag 38 corresponding to such destination while the carousel continues to turn, this operation having been represented by arrows labeled "B". The carousel only turns about 12 r.p.m. or so and, at this rate, the sorters can easily read addresses imprinted upon the front wall 48 of the bins. In addition to the imprinted addressed information on the front of the bins 50, (FIG. 1) they are also preferably color coded to make sure the bin is emptied into a receptacle headed for the right destination.

A skilled sorter can handle from 35–50 pieces of mail a minute with this sorting system and stand in the same position while doing so. No sorter need reach across another because, in time, the bin will move into a position where the mail can be placed therein without interference. Bin labels can be changed at will and more than one bin can be used for mail addressed to the same destination in the case of extra heavy volume. In such a circumstance, it is well to place the bins on opposite sides of the unit. It is even possible to use the same carousel for a coarse and a fine sort. One sorter, for instance, need only sort by plant, department or some other major addressee subdivision, whereupon the bins containing the mail thus "rough sorted" can be returned to the receiving stations and other sorters for a "fine sort" into some smaller addressee category.

While the sorting operation is taking place, the carousel is unloaded and the mail distributed to its destination. In so doing, an operator merely steps into a vacant area between the sorters, pulls a bin from its pigeonhole and empties the contents thereof into an awaiting receptacle preparatory to returning the empty bin to its original position on a subsequent pass. At most, the sorters only miss one chance at the missing bin because the several seconds it takes to make a complete revolution is ample time to remove a bin, empty it and get ready to replace it. This distribution function has been represented in FIGS. 1 and 2 by arrows "C" and the detached bins. Also, while it has not been specifically il-

lustrated, the mail bags 38 can be pulled free of their clamps 36 and sent off to their destinations while the unit is being used to sort mail in the same way as was true of the bins. As far as the mail bags are concerned, however, they are usually not emptied and placed back on the carousel. Instead, the full bag is sent off to its destination and another bag is clamped in its place while the unit continues to rotate.

Referring next to FIGS. 3 and 4 for a detailed description of the carousel unit 10, it will be seen to include an upstanding tubular centerpost 52 rigidly and non-rotatably mounted within a flanged collar 54 (FIG. 3) located at the intersection of crossed beams 56 of the frame which has been broadly designated by reference numeral 58. Adjustable feet 60 are provided beneath the crossframe elements 56 of this frame for leveling purposes.

Supported atop frame 58 is an annular skirt 62 overlayed by a horizontally-disposed rim 64 having a large opening 66 in the center thereof within which is housed the drive flange subassembly that has been generally designated by numeral 68, all of which are most clearly revealed in FIG. 3. Three sleeve bearings 70L, 70M and 70T are journalled for rotation one above the other on the centerpost with the lowermost one 70L resting atop a thrust bearing 72. The lower and middle sleeve bearing 70L and 70M are interconnected by radially-extending webs 74 which support a disc 76 from the underside. This disc is, in turn, bordered by a marginal drive flange 78 against the inside surface of which the friction wheel 80 of drive mechanism 22 bears at all times to define a driving connection.

On the top of this disc spaced inwardly of the drive flange 78 but in concentric relation thereto is an upstanding brake flange 82 which forms a part of the automatic brake subassembly that has been illustrated in FIGS. 5 and 6 which has been broadly designated by reference numeral 84, the details of which will be set forth presently.

Next, in connection with FIG. 3, it will be seen that the middle and upper sleeve bearings 70M and 70T are separated by a sleeve 86 as shown. The lowermost shelf 30L of the rotating subassembly 24 is mounted atop this upper sleeve bearing for conjoint rotation therewith. Extending upwardly from this bottom shelf are the partition walls 26 that divide the rotating assembly into the several wedge-shaped compartments 28 and 28M. The middle and upper shelves 30M and 30U, respectively, further subdivide the compartments 28 into the pigeonholes 32 as has already been explained in detail in connection with FIGS. 1 and 2. In the particular form shown, each pair of adjacent partition walls 26 are bridged by back walls 88 that cooperate with one another to define a central polygonal core enclosing the centerpost. In the particular form shown, the back walls 88 in the mail bag compartments 28M are moved out to make such compartments somewhat shallower than their counterparts 28 subdivided into pigeonholes, however, such construction is a matter of choice and has no functional significance.

Each of the bin-receiving pigeonholes 32 is provided with a stop 90 which limits the penetration of the bin. While the back wall 88 of the pigeonhole would perform the self-same function, repeated contact of the bin against this wall would, in time, severely damage same, whereas, the stop 90 can easily absorb such punishment.

With the rotating subassembly 24 turning, there is, of course, a centrifugal force component acting to fling the bins out of their pigeonholes. While the speed of rotation is slow enough that the likelihood of this happening is minimal, nevertheless friction lifts 92 are provided on each shelf adjacent the front wall of each bin in supporting relation therebeneath. In order for the bin to come out of its pigeonhole by itself, the frictional component must be overcome and, in addition, the centrifugal force must be of a magnitude sufficient to raise it over the hump produced by the lift. These lifts have a second function which is probably of equal practical importance, namely, that of raising the front edge of the bin so that the operator can leave his fingers or thumb underneath it without getting them pinched as he replaces the bin. To a lesser extent, they also facilitate removal of the bins.

Manually-operated foot brake 20 includes an annular skirt 94 suspended beneath the underside of the rotating assembly 24 where it extends down into central opening 66 in the base 18 and is free to rotate therein. Encircling the lower edge of this skirt is a brake band 96 that faces downwardly. A foot pedal 98 mounted on the base 18 for rockable movement about a horizontal axis intermediate its ends actuates a push rod 100 which carries a brake shoe 102 on top thereof in position to make frictional contact with the brake band 96. The pedal 98 is accessible to the operator within a notch 104 provided for this purpose in skirt 62. Actually, the driving force used to turn the rotating assembly is so small that the unit can easily be stopped by hand and this is often done instead of using the foot brake.

Next, with reference to FIGS. 3, 4 and 7, it will be seen that the drive mechanism 22 comprises a conventional gear motor 106, the output shaft 108 of which is fitted with the friction drive wheel 80. The motor is mounted for tiltable movement about a horizontal axis defined by pivot pin 110 on a suitably-located element 112 of the frame. This pivotal connection is located well on one side of the balance point of the assembly in the manner of a Rockwood motor mount so that the overbalanced condition continuously biases the friction wheel 80 into driving frictional contact with drive flange 78. A tension spring 114 connected between the motor and mount therefor supplements the frictional load between the wheel and flange occasioned by the overbalanced condition alone and it also keeps the motor from bouncing thus maintaining a continuous driving relation between the drive and driven elements.

Finally, reference will be made to FIGS. 3–6, inclusive, for a description of the unique automatic braking subassembly 84 and the way in which it cooperates with the friction drive mechanism 22. An upright wall-forming member 116 bridges the space between sleeve 86 and the brake flange 82 thus providing the means for mounting the aforementioned automatic braking subassembly. A pair of mounting brackets 118 and 120 adjustably mount idler wheel axle 122 in vertical position. The fastener opening 124 on one side of upper bracket 118 is slotted so that it will accommodate a slight tilt in axle 122 to the degree necessary to maintain idler wheel 126 in rolling engagement with brake flange 82. Lower bracket 120 is horizontally slotted as indicated at 128 for movement toward and away from flange 82. It is also provided with an ear 130 to which one end of tension spring 132 is attached. The other

end of this tension spring is adjustably fastened to bracket **134** carried by skirt **94**. Brackets **118** and **120** are both loosely fastened to wall **116** so that tension spring **132** can pull the idler wheel into tight rolling contact with flange **82** at all times. Screw eye **136** interposed between the spring and bracket **134** provides the means by which the frictional load therebetween can be adjusted should the occasion for doing so arise. FIG. **7** shows a similar screw eye being used on the motor mount tension spring that accomplishes the same purpose. A head **138** atop axle **122** keeps it from falling through the shaft-receiving opening **140** in bracket **118**. Thus, idler wheel **126** is continuously biased into rolling engagement with brake flange **82** at all times.

Now, permanently fastened to the top of idler wheel **122** is an undulating brake disc **142**. A bracket **144** mounts a brake pin **146** above the brake disc for movement into contact with the marginal edge thereof. This pin is encircled by a collar **148** that defines a fixed abutment for the lower end of compression spring **150**. A threaded pin **152** is fastened in the top of the bracket **144** by two nuts **154** which cooperate therewith and with one another to lock same in axial alignment with pin **146**. Spring **150** is retained because these pins and washer-type spacers **156** are used to vary the preload force with which pin **146** engages brake disc **142**.

With the carousel rotating, the driving force exerted by friction wheel **80** against drive flange **78** is adjusted and maintained such that it will keep on turning. This means that the driving connection must exert sufficient force to keep idler wheel **126** turned by brake flange **82** rotating despite the action of pin **146** pressed thereagainst trying to stop it. Saying this another way, the friction drive subassembly **22** must develop sufficient power to keep the rotating subassembly rotating and, in addition, to ride pin **146** up and down over the undulations in brake disc **142** once the carousel is in motion.

Now, having once attained this condition through appropriate adjustment of the various springs, the unit should be stopped. The tendency of the drive mechanism **22** is, of course, to start the unit rotating again which it will do unless the force exerted by pin **146** atop brake disc **142** is sufficient to prevent this from happening. Idler wheel **126** alone is, of course, an inconsequential factor in keeping the rotating subassembly from turning as it is entirely free to roll along the brake flange. Accordingly, to keep the unit from rotating once it has been stopped, one need only increase the bias on pin **146** until the drive mechanism is incapable of making such pin climb up over the hump **160** in the brake disc. Saying this another way, once the frictional force developed by the drive mechanism is insufficient to turn the idler wheel through the medium of brake flange **82** until hump **160** is forced past pin **146**, the unit will remain stopped because with the idler wheel unable to turn, it will press against the brake flange with sufficient force to keep the whole rotating assembly from turning. In the meantime, the drive mechanism continues to run with friction wheel turning and slipping against the drive flange. After stopping the unit, the drive mechanism will actually start to turn it through a fraction of a revolution necessary for the pin **146** to drop into one of the low areas **162** of the undulating surface where it cannot climb out again over hump **160** therein. Once started rotating with sufficient angular velocity to keep the pin **146** riding up over the hump, the friction drive should be adjusted to maintain this condition.

Obviously, this delicate balance must be achieved through trial and error. For instance, just stopping the idler wheel is not enough if spring **132** is not exerting sufficient tension to hold it against the brake flange and keep the drive mechanism from overriding same. In other words, once the pin keeps the idler wheel from turning, the frictional force between it and the brake flange must exceed that of the friction wheel against the drive flange. Conversely, with the unit turning, the driving force exerted upon the drive flange must be greater than the retarding force exerted by the pin as it slides over the undulations in the brake disc.

What is claimed is:

1. Apparatus for sorting mail which comprises: a stationary base; a movable subassembly mounted atop the base for rotational movement about a vertical axis, said subassembly including a plurality of radially-extending partition walls driving the exterior thereof into compartments, horizontally-disposed shelves bridging the space separating at least some of the adjacent partition walls subdividing the compartment defined therebetween into two or more pigeonholes arranged one above another in tiered relation, and drawer-like mail-receiving bins removably mounted within the pigeonholes; friction drive means for rotating the movable subassembly including a motor carried by one of said base and movable subassembly elements and a driven friction wheel in continuous driving engagement with the other of said elements; and, friction brake means for preventing relative movement between said base and rotating subassembly including brake shoe forming means carried by one of said base and rotating subassembly elements in continuous contact with the other of said elements, said friction brake means being automatically operative to override the friction drive means and stop the rotating subassembly when the speed of the latter is slowed down below a predetermined level, and said friction drive means being automatically operative to override said friction brake means and keep said rotating subassembly turning when the speed thereof exceeds said predetermined level.

2. The apparatus as set forth in claim **1** in which: at least one compartment is left sufficiently free of shelves to accommodate a mailbag hung therein; and, in which clip means for detachably supporting a mailbag within said shelf-free compartment are mounted upon the opposed surfaces of the partition walls defining same.

3. The apparatus as set forth in claim **1** in which: the friction brake means is carried by the rotating assembly for rotation therewith and the brake shoe forming means contacts the base.

4. The apparatus as set forth in claim **1** in which: means are located on each shelf adjacent the front edge thereof effective to support the front end of a bin resting thereon and tilt same rearwardly.

5. The apparatus as set forth in claim **4** in which: the bin-lifting means are of a size effective to raise the bins to a level where the fingers can be inserted therebeneath.

6. The apparatus as set forth in claim **1** which includes: at least one stationary mail-receiving station located alongside the movable subassembly.

7. The apparatus as set forth in claim **6** in which: the mail-receiving station comprises an elongate tray-like

receptacle extending outward radially from the movable subassembly.

8. The apparatus as set forth in claim **1** which includes: two or more stationary mail-receiving stations grouped around the movable subassembly in angularly-spaced relation to one another.

9. The apparatus as set forth in claim **8** in which: a mail collection and distribution station is positioned in the space between adjacent receiving stations on an intermittent basis.

10. The apparatus as set forth in claim **1** in which: the friction drive means is pivotally mounted on the base for rockable movement about a substantially horizontal axis; and, in which first spring means connected to the friction drive means continuously biases the friction drive wheel into driving engagement with the rotating subassembly.

11. The apparatus as set forth in claim **10** in which: the axis of pivotal movement is displaced toward the friction wheel so as to produce an imbalanced condition effective to assist the spring means in maintaining said friction wheel in driving engagement with said rotating subassembly.

12. The apparatus as set forth in claim **10** in which: first bias adjustment means is associated with said first spring means operative upon actuation to vary the load of the friction wheel against the movable subassembly.

13. The apparatus as set forth in claim **1** in which: the brake shoe forming means of the friction brake means comprises an idler wheel in continuous rolling engagement with said other of said elements; and, in which said friction brake means also includes a brake disc with an undulating surface having a hump therein mounted on one side of said idler wheel for conjoint rotation therewith and a spring-biased pin carried by the same element as said idler wheel positioned to make sliding contact with the undulating surface of said brake disc as said idler wheel turns, said friction drive means being ineffective to turn the rotating subassembly with sufficient force to move the hump in the surface of the undulating disc past the pin when the idler wheel is stopped, and the biasing force on said pin being ineffective to stop said idler wheel from turning when the rotating subassembly is turning.

14. The apparatus as set forth in claim **13** in which: a compression spring biases the pin into continuous engagement with the brake disc; and, in which second bias adjustment means is associated with said compression spring operative upon actuation to vary the biasing force.

15. The apparatus as set forth in claim **13** in which: the idler wheel is mounted for rotation about an axis tiltable in a plane containing the point of tangency between said wheel and the surface of said other of said elements upon which it rolls.

16. The apparatus as set forth in claim **13** in which: second spring means is connected to the idler wheel normally biasing same into rolling engagement with said other of said elements.

17. The apparatus as set forth in claim **16** in which: third bias adjustment means is associated with said second spring means operative upon actuation to vary the biasing force with which said pin is urged against said undulating disc.

18. In the method for sorting mail wherein the mail to be sorted is sorted according to addressee and placed in pigeonholes corresponding to said addressee, the improvement which comprises circulating said pigeonholes repeatedly past a fixed sorting station where the operator can stay in one place and sort the mail into the appropriated pigeonholes as they move past.

19. The improved method as set forth in claim **18** in which two or more fixed sorting stations are grouped around a common set of circulating pigeonholes so that the respective operators can each sort into the same pigeonholes from different locations without interfering with one another.

20. The method of sorting mail which comprises the steps of: collecting the mail to be sorted at at least one fixed station positioned adjacent a rotating station having a plurality of mail-receiving pigeonholes arranged around the periphery thereof visually coded to receive mail addressed to a given destination, sorting the mail at the fixed station and placing same according to destination in the appropriate pigeonhole as it moves past said fixed station.

21. The method as set forth in claim **20** which includes the step of retrieving the mail thus sorted from the pigeonholes as they move past a second fixed station on the periphery thereof.

22. The method of handling mail which comprises the steps of: delivering the mail to be sorted to two or more receiving stations grouped in fixed angularly-spaced relation around a common collection station having a plurality of removable visually-coded mail-receiving receptacles repeatedly circulating past each of said receiving stations in succession, sorting the mail at each receiving station according to destination and inserting same thus sorted into the appropriate mail-receiving receptacle as it moves by, periodially removing the receptacles and emptying same as they move past a fixed position between receiving stations, and replacing the receptacle thus emptied on a subsequent pass.

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