

Sept. 30, 1969

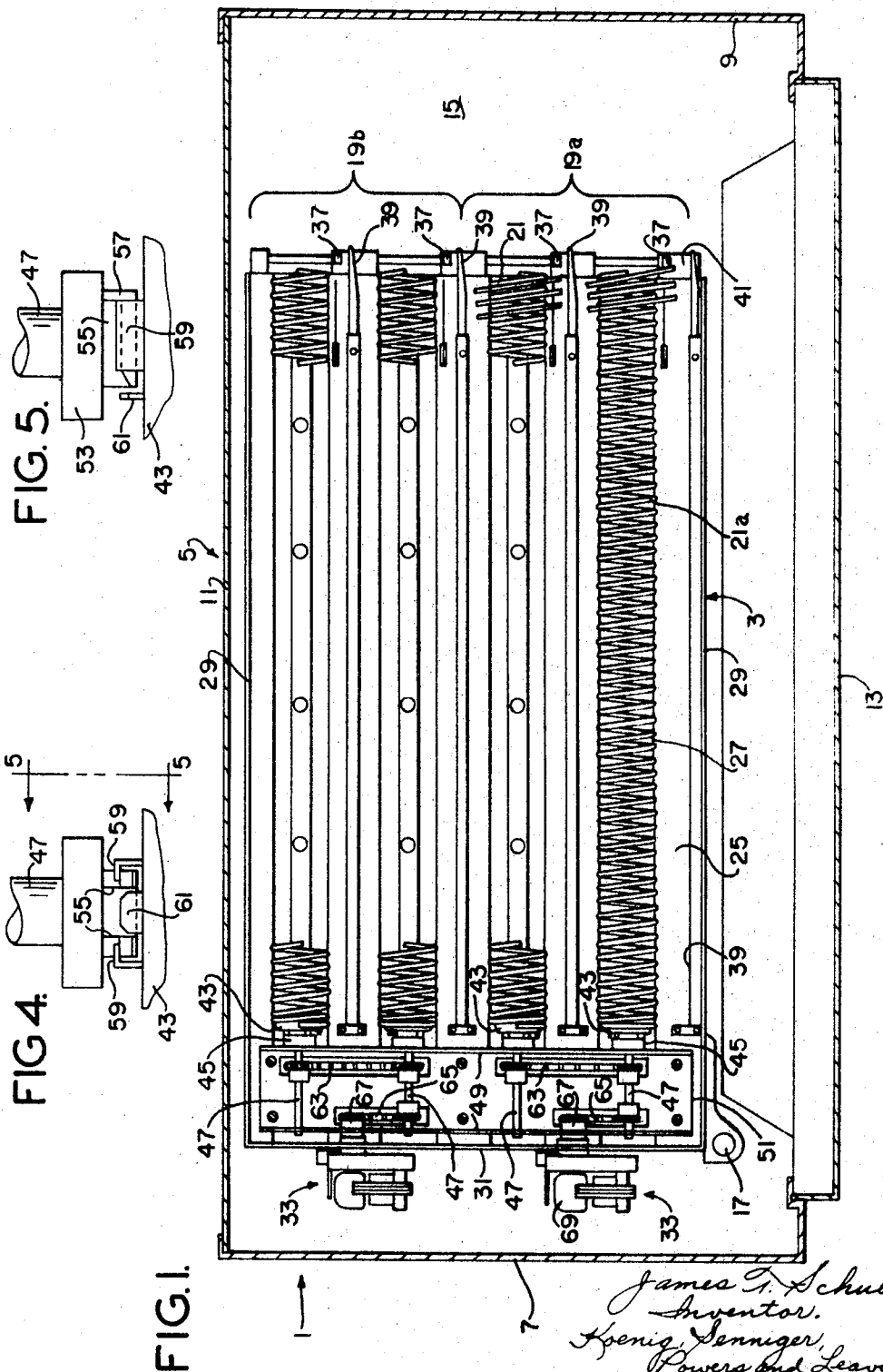
J. T. SCHULLER

3,469,738

CELLULAR MAGAZINE TYPE DISPENSING APPARATUS

Filed Sept. 11, 1967

2 Sheets-Sheet 1



James T. Schuller,
Inventor.
Koenig, Senniger,
Powers and Leavitt,
Attorneys.

Sept. 30, 1969

J. T. SCHULLER

3,469,738

CELLULAR MAGAZINE TYPE DISPENSING APPARATUS

Filed Sept. 11, 1967

2 Sheets-Sheet 2

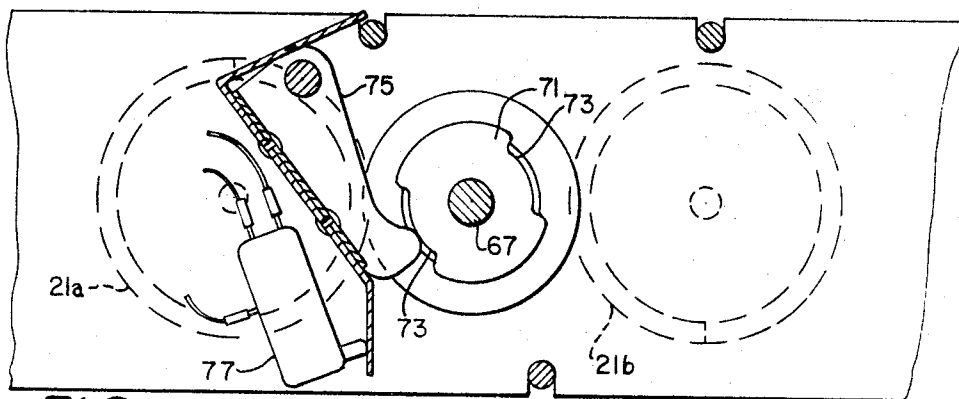


FIG. 2.

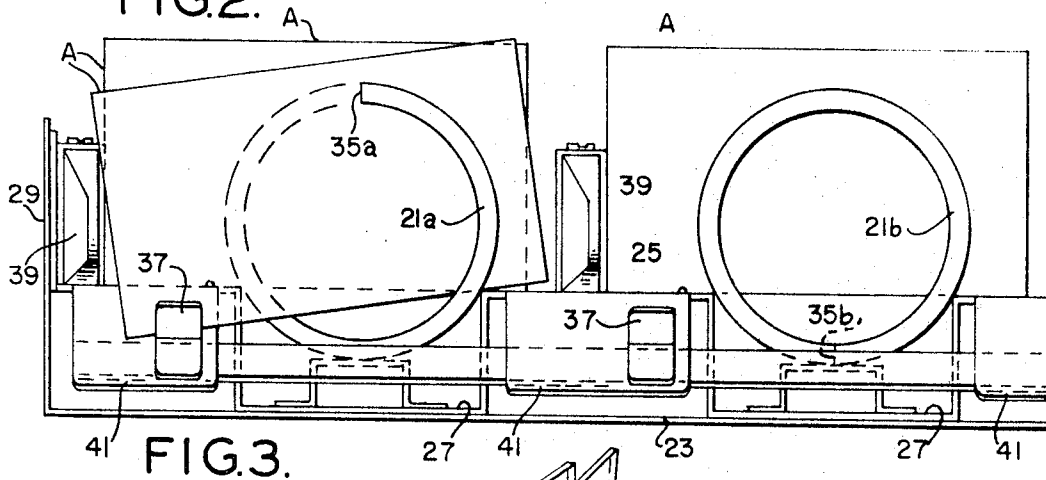


FIG. 3.

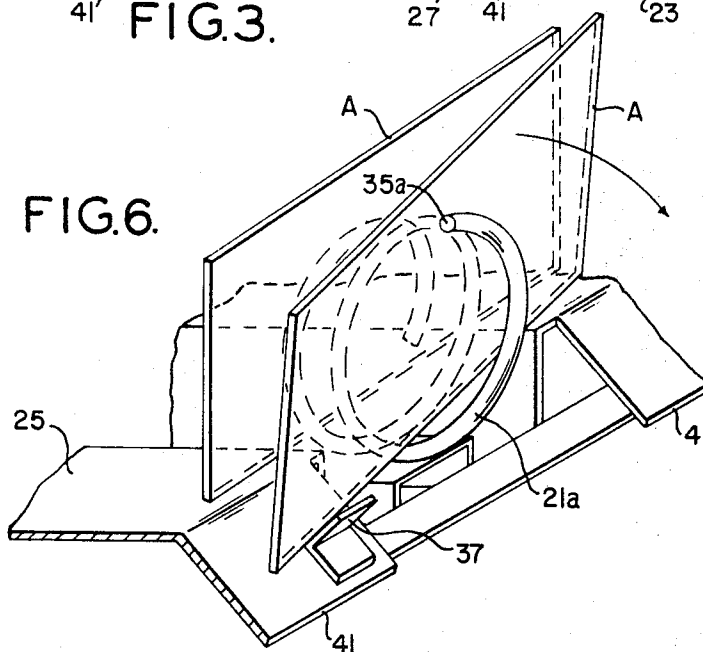


FIG. 6.

1

2

3,469,738

CELLULAR MAGAZINE TYPE DISPENSING APPARATUS

James T. Schuller, St. Ann, Mo., assignor to UMC Industries, Inc., St. Louis, Mo., a corporation of Delaware

Filed Sept. 11, 1967, Ser. No. 666,903

Int. Cl. B65h 5/28; G07f 11/36

U.S. Cl. 221—75

5 Claims

ABSTRACT OF THE DISCLOSURE

Article dispensing apparatus comprising a shelf supporting a pair of helices and having an article stop for each helix at the discharge end of the shelf. The helices are driven in half-revolution cycles by a common motor, and are 180° out of phase for alternately dispensing an article (such as a postage stamp book) from one helix and then the other on successive vend cycles, in conjunction with the stops.

BACKGROUND OF THE INVENTION

The invention pertains to article dispensing apparatus, and more particularly to such apparatus of a type which may be referred to as a spiral vendor, in which articles to be vended (such as postage stamp booklets) are dispensed by augering by means of helices.

The invention involves an improvement on the spiral vendor shown in the coassigned U.S. Patent 3,335,907 of Alvin W. Holstein and James T. Schuller, issued Aug. 15, 1967. In the spiral vendor shown therein, which has been sold extensively for vending items such as candy bars, loose candy in boxes, etc., each helix is driven by its own individual electric motor. This imposes a cost factor, which it may be desirable to reduce for certain users of these vendors, e.g., the Post Office Department, which has purchased these spiral vendors for use in post office branches to vend stamp books, etc.

SUMMARY OF THE INVENTION

Accordingly, among the several objects of the invention may be noted the provision of an improvement on the spiral vendor shown in the above-noted U.S. Patent 3,335,907 by which the number of motors for driving the helices is substantially reduced, for reduction in cost of the vendor. In general, the improvement involves the driving of two helices on a shelf of the vendor by a single drive motor, the two helices being 180° out of phase with one another, and the provision of stops at the discharge end of the shelf with the arrangement such that, while both helices are driven on each vend cycle, articles are vended alternately from the helices on successive vend cycles, rather than vending from both helices on each vend cycle. Other objects and features will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in horizontal section of a spiral vendor incorporating the present invention;

FIG. 2 is an enlarged vertical section showing a cam-actuated switch for controlling the drive motor for two helices;

FIG. 3 is a fragmentary view of the discharge end of the shelf;

FIG. 4 is an enlarged fragment of FIG. 1;

FIG. 5 is a view on line 5—5 of FIG. 4; and

FIG. 6 is a perspective showing the forward end of a helix.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, there is indicated at 1 in FIG. 1 a spiral vendor of the type shown in the above-mentioned U.S. Patent 3,335,907 in which the present invention is incorporated. At 3 is indicated one of the shelves of the vendor. This is housed in cabinet 5 which has left and right side walls 7 and 9, a back wall 11 and a front door 13. The shelf extends across the cabinet from adjacent the left side wall 7, terminating short of the right side wall to provide a space 15 through which articles discharged from the right end of the shelf (referred to as its forward or discharge end) may fall to a delivery station. The shelf is pivoted at its left front corner on a vertical post 17 in the cabinet.

The shelf carries two dispensing units 19a and 19b. These are generally identical, and a description of one will suffice for both. Thus, unit 19a comprises a pair of helices 21a and 21b extending alongside one another on the shelf from adjacent the left end (the rearward end) of the shelf to its discharge end, each adapted on rotation thereof to feed forward articles A, such as postage stamp books, received between its convolutions for dispensing the articles one-by-one off the shelf. The shelf comprises an assembly of a bottom plate 23 and a top plate 25, the latter being formed to provide channels or troughs each designated 27 extending lengthwise of the shelf. Each helix extends lengthwise in a respective trough, and projects up out of the trough. The shelf has upstanding side walls 29 and an upstanding rearward end wall 31. Items A to be vended, such as postage stamp books, may be placed between the convolutions of the helix with end portions of the items resting on the shelf at opposite sides of the trough. Means indicated at 33 is provided for rotating the two helices 21a and 21b in unison through one-half a revolution on each vend cycle. The two helices are rotated in the same direction (clockwise as viewed in FIG. 3), and have their forward ends 35a and 35b 180° out of phase one with respect to the other for dispensing alternately from one helix and then the other on successive vend cycles, in conjunction with fixed article stops 37 at the discharge end of the shelf. Thus, as appears in FIG. 3, the forward end 35a of helix 21a is at the top, and the forward end 35b of helix 21b is at the bottom, 180° out of phase with respect to 35a.

Each helix may consist of an open-pitch coil spring, preferably having a plastic coating. For dispensing thin-profile items such as stamp books, close-pitch springs are used. Guides 39 are provided on opposite sides of each helix for confinement of items endwise of the items while permitting the items to slide toward the discharge end of the shelf by the augering action of the helix. The shelf has extensions at its discharge end on opposite sides of each trough, these extensions being bent down to form downwardly angled ramps 41 which constitute slides down which articles pushed forward by the helix may slide off the discharge end. The stops 37 project upward from the ramps on the left sides of the helices as viewed in FIG. 3.

As to the drive means 33 for rotating the two helices 21a and 21b in unison, each helix has a coupling element 43 at its rearward end removably mating with a coupling element 45 on a shaft 47 journaled in the upstanding flanges 49 of a channel 51 which extends transversely across the shelf adjacent its rearward end. Each coupling element 47 comprises a head 53 secured on the forward end of the respective shaft 47 having side-opening grooves 55 (see FIGS. 4 and 5) closed at one end as indicated at 57. Each coupling element 43 comprises a sheet metal cap secured to the rearward end of the respective helix having struck-out tongues 59 slidably received in the grooves 55 of the respective head 53, and a struck-out

stop 61 at one end of the tongues. The two shafts 47 are interconnected by a chain and sprocket drive 63 for rotation in unison with the heads 53 on the shafts 180° out of phase so that the forward ends 35a and 35b of the two helices 21a and 21b are 180° out of phase. It will be observed the coupling elements 43 are interengageable with coupling elements 45 only in one direction to insure coupling of the helices to shafts 47 with the forward ends of the helices 180° out of phase. One of the shafts 47 (the shaft for helix 21a as herein shown) is driven via a chain and sprocket drive 65 from the output shaft 67 of an electric motor-speed reducer unit 69 (a gearmotor) mounted on the outside of rearward end wall of the shelf. Shaft 67 carries a cam 71 having two notches 73 180° apart, this cam being engageable by a pivoted follower 75 actuating a motor control switch 77 for de-energizing the motor, once it has been started on a vend cycle, after one-half a revolution of the output shaft and the helices 21a and 21b.

Operation is as follows:

It will be assumed that articles A, such as postage stamp books, of the same class (e.g., \$1.00 stamp books) have been placed between the convolutions of both helices 21a and 21b, and that these helices are in the position where the forward end 35a of helix 21a is at the top in an up position and the forward end 35b of helix 21b is at the bottom in a down position. Under these circumstances, the article at the discharge end of helix 21a is held against sliding off the discharge end of the shelf by being caught at its right by the forward end portion of helix 21a which extends up above the shelf and at its left by the respective stop 37 (see FIG. 6). The article at the discharge end of the other helix 21b is caught behind the foremost end convolution of helix 21b in its entirety.

On the ensuing vend cycle, the helices 21a and 21b rotate in unison in clockwise direction as viewed in FIGS. 3 and 6 through half a revolution. As the forward end 35a of helix 21a moves clockwise around and downward away from its up position, it initially moves in the direction away from the respective stop 37 (the stop being located at the left-hand side of the helix for this purpose), and the forward article A in this helix starts tipping forward, and when the forward end 35a of helix passes down below the bottom edge of the article, the article tips completely over the stop 37 and falls off. The helices come to a stop with helix 21b in a position corresponding to that previously occupied by helix 21a and with the latter in a position corresponding to that previously occupied by helix 21b so that, on the next vend cycle (i.e., the next half-revolution of the helices), the forward article in helix 21b is discharged in the same manner. On the next vend cycle, the forward article in helix 21a is discharged, and so on.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

What is claimed is:

1. Article dispensing apparatus comprising a shelf, a pair of helices extending lengthwise on the shelf alongside one another to one end of the shelf constituting its discharge end, a single-motor drive for the two helices for rotating them in unison through a half-revolution on successive dispensing cycles to feed articles positioned between the convolutions of the helices forward on the shelf toward its discharge end, the forward ends of the helices being 180° out of phase and disposed so that, when the helices are at rest, the forward end of one helix is in an up position and the forward end of the other is in a down position, and a pair of stops, one for each helix, each located at the discharge end of the shelf at that side of the respective helix in relation to the direction of rotation of the helix such that the forward end of the helix, in rotating away from its up position, initially moves in the direction away from the stop, each stop engaging the lower portion of the forward article in the respective helix when the forward end of the latter is in its up position, said forward article being discharged when the end of the helix moves down through a half-revolution by falling over the stop, whereby articles are alternately dispensed from the helices on successive dispensing cycles.

2. Apparatus as set forth in claim 1 wherein the shelf has ramps inclined downward at its discharge end on opposite sides of the helix, and each stop is on a ramp at one side of the respective helix.

3. Apparatus as set forth in claim 2 wherein the shelf carries a pair of drive shafts, one for each helix, at its other end, said shafts being interconnected for driving both helices in the same direction, the motor of said single-motor drive being connected to one of said shafts, said shafts extending axially in respect to the helices and having coupling elements at their forward ends, said helices having coupling elements at their rearward ends removably interengaging the coupling elements on the shafts.

4. Apparatus as set forth in claim 3 wherein the coupling elements on the shafts are 180° out of phase.

5. Apparatus as set forth in claim 4 wherein the coupling elements are interengageable only in one direction to establish the 180° out of phase relation of the forward ends of the helices.

References Cited

UNITED STATES PATENTS

2,304,484	12/1942	Smith	221—172 X
2,564,552	8/1951	Verdery	221—75
3,036,730	5/1962	Newberry	221—75
3,085,711	4/1963	Holstein et al.	221—75
3,178,055	4/1965	Schuller	221—75
3,269,595	8/1966	Krakauer	221—75
3,335,907	8/1967	Holstein et al.	221—75

SAMUEL F. COLEMAN, Primary Examiner