

[54] STAMP DISPENSING APPARATUS

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[51] Int. Cl. **B65h 25/32**

[58] Field of Search 226/134, 135, 136, 226/137, 141, 76, 43, 194, 190, 196

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[57] ABSTRACT

An elongated web of stamps having a longitudinally spaced transverse row of perforations between each stamp is stored as a roll in the apparatus. The apparatus unwinds the stamp web from the roll and dispenses the desired number of stamps in response to the depositing of a preselected amount of money in the apparatus. The stamp web is engaged on opposite sides by a drive wheel and an idler wheel, respectively, during the dispensing operation. When the drive wheel is rotated, it moves the stamp web between two knife blades and into the opening through which the stamps are dispensed. Electrical contacts, located on opposite sides of the stamp web, make contact with each other and actuate a circuit as each row of perforations passes between the contacts. This circuit counts the number of stamps being dispensed and stops the drive wheel when the desired number of stamps are positioned to be cut from the web by the knives. After each dispensing operation, the idler wheel moves out of engagement with the stamp web.

[56]

References Cited

UNITED STATES PATENTS

3,300,113	1/1967	Lane	226/135
3,158,056	11/1964	Whitmore	226/135 X
1,839,398	1/1932	Lee	209/110 X
3,655,109	4/1972	Stevens	226/135
3,015,426	1/1962	Dietz et al.	226/135 X
3,528,594	9/1970	Walker	226/135 X

4 Claims, 9 Drawing Figures

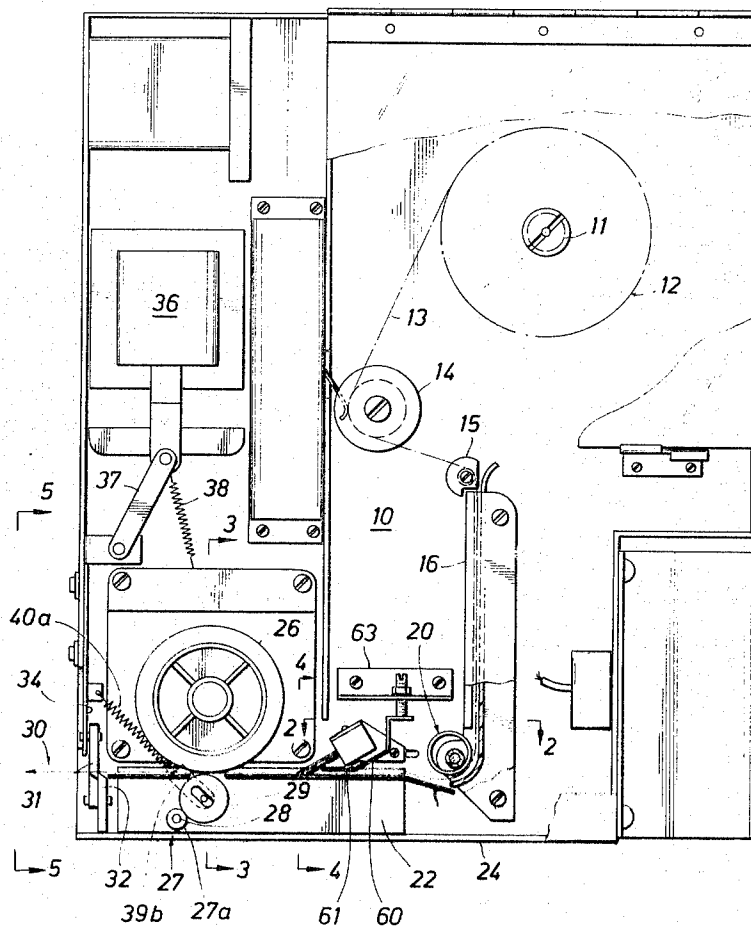


FIG. 1

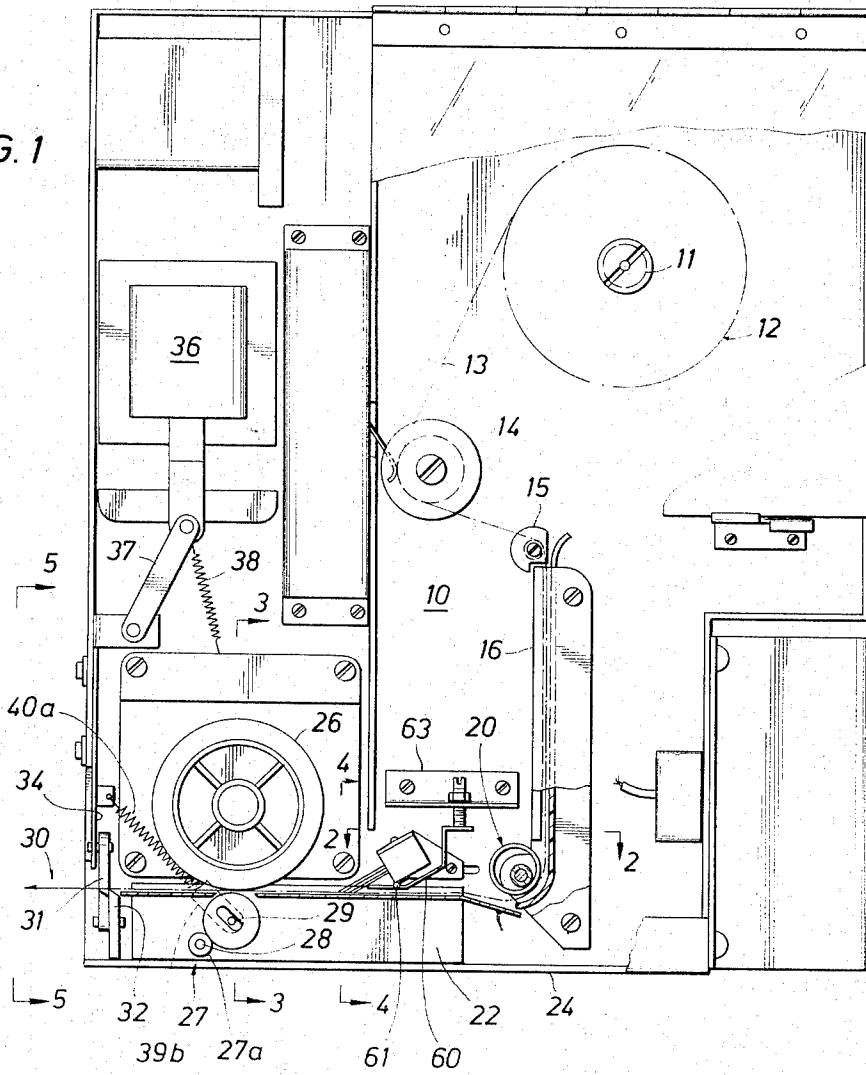


FIG. 2

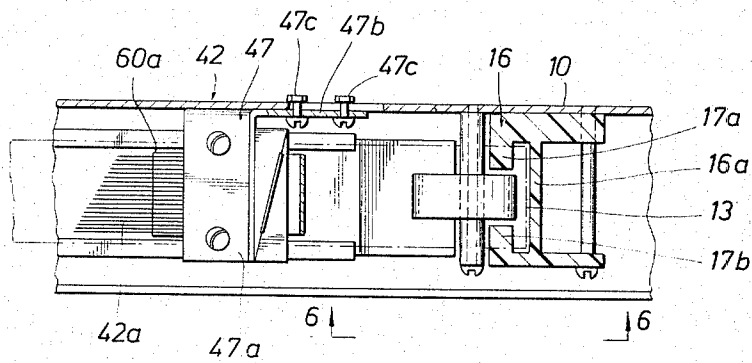


FIG. 3

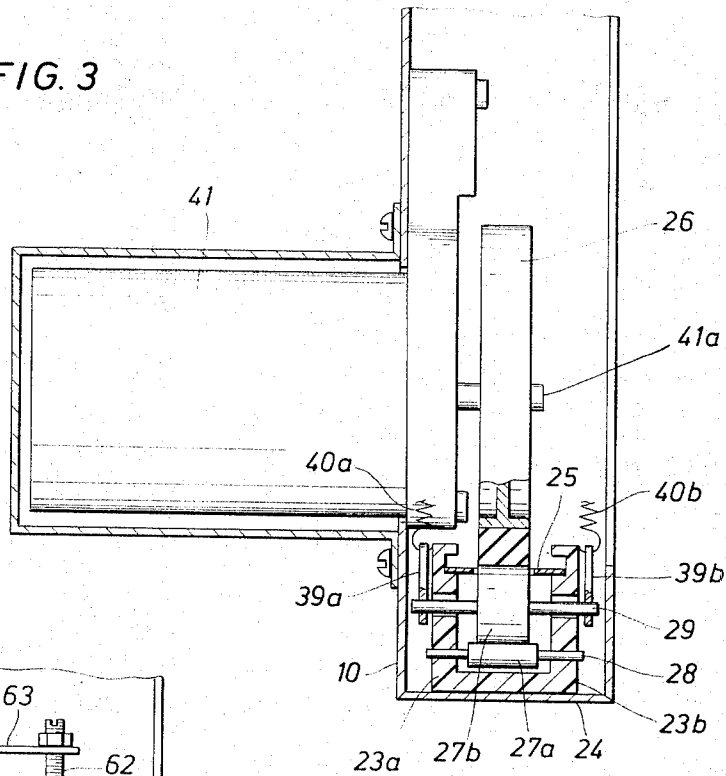
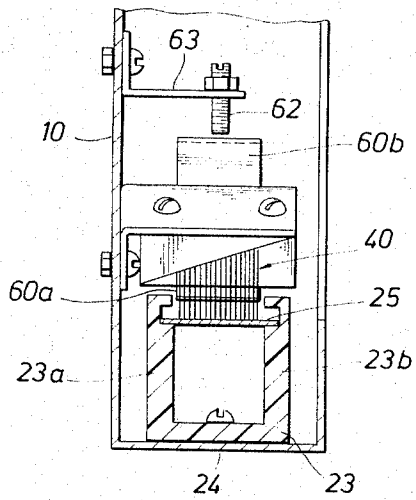


FIG. 4

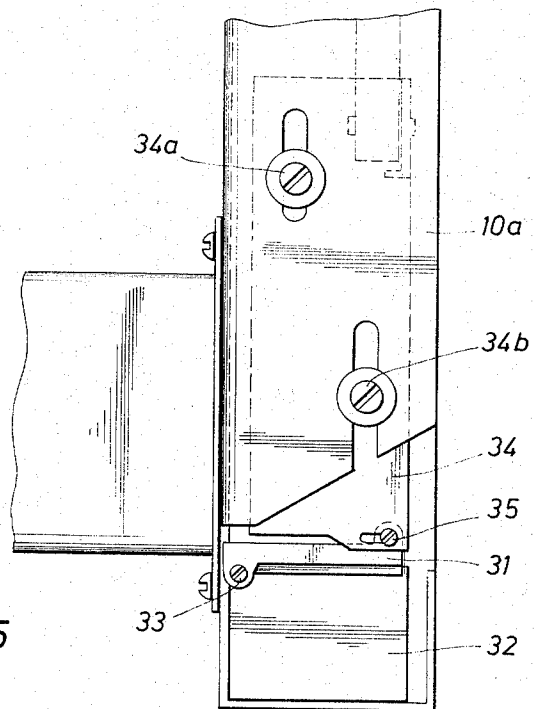
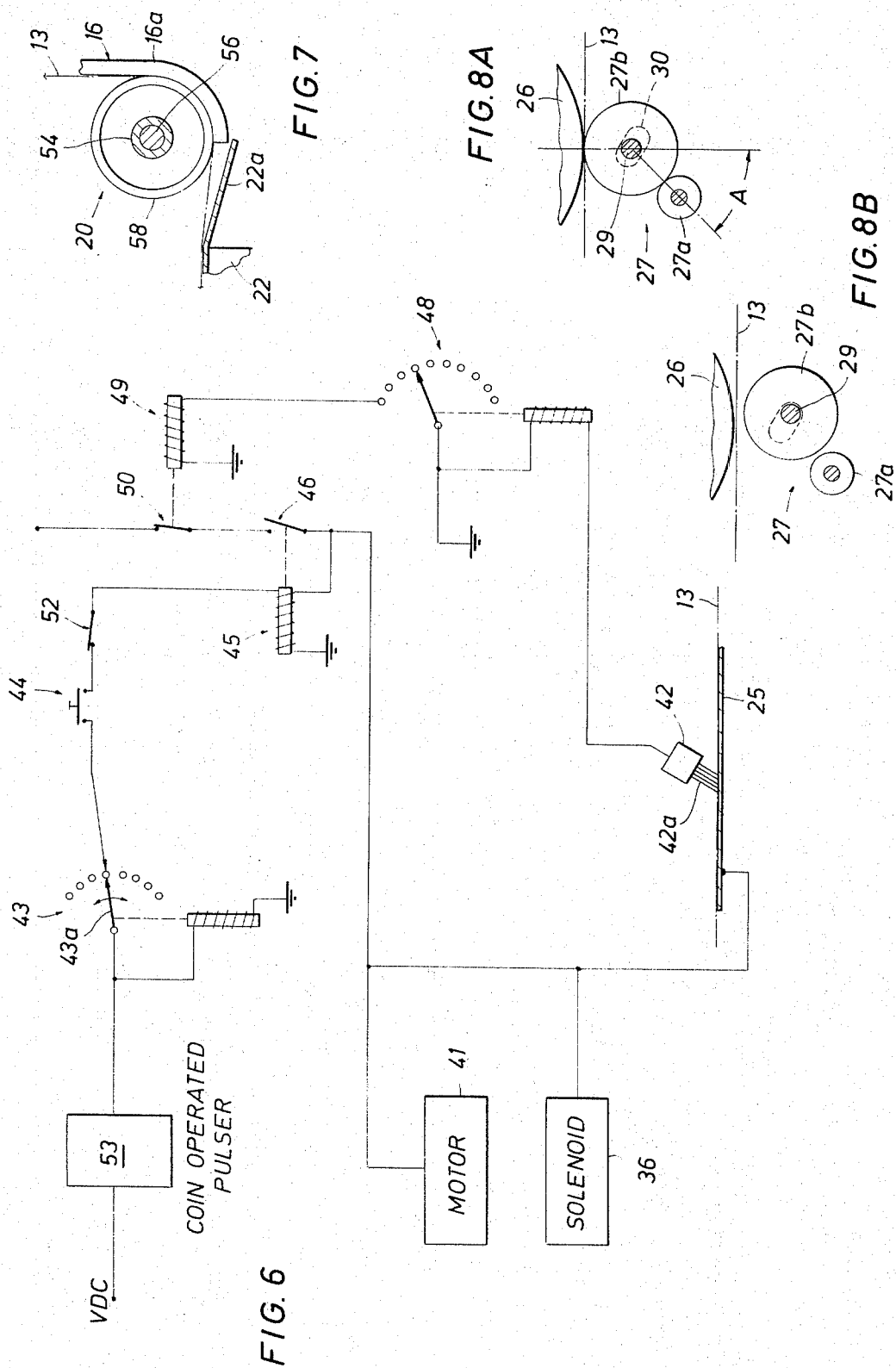


FIG. 5



STAMP DISPENSING APPARATUS

This invention relates to stamp dispensing apparatus, generally, and in particular to such apparatus that dispense stamps from an elongated web or tape of stamps having a longitudinally spaced transverse row of perforations between each stamp.

Where stamps are vended from an elongated web of the stamps, the stamp or stamps being vended are cut from the web as the final act of the vending operation. This is usually done by a guillotine type knife blade that falls through the web to cut off the stamp or stamps to be vended. Since the position of the knife blade is fixed, the stamp web must be positioned at the end of each vending operation for the blade to cut the web between stamps. This means that once the stamp web is positioned properly, the distance the web is moved with each vending operation must be substantially constant with a minimum of variation. Otherwise, the blade will begin to cut into the stamps rather than in between the stamps, thus mutilating at least one stamp with each vending operation. It is also important that any error, occurring in the movement of the web, not be cumulative, because many stamp vending machines vend hundreds of stamps between service calls, and even a slight error in the cut off point, if cumulative, could not be tolerated.

Various ways have been used in the past to insure that the stamp web is moved the same distance during each vending operation. One of the simplest ways of moving the web structurally, is to use rollers or wheels that engage the web on opposite sides and move the web between them. The problem, however, is controlling the rotation of the driving wheel so that the web is moved the same distance each operation.

It is an object of this invention to provide stamp vending apparatus that employs a drive wheel to engage the stamp web and move it during the dispensing operation, and that will move the stamp web substantially the same preselected distance during each vending operation.

It is another object of this invention to provide such a stamp vending apparatus wherein any error that may occur in the movement of the stamp web during one vending operation is not cumulative and will tend to be corrected in the next vending operation.

It is another object of this invention to provide such a stamp vending apparatus that counts the number of stamps being vended by counting the rows of perforations that pass by the counting means and that stops the rotation of the drive wheel moving the web when the preselected number of stamps are positioned to be cut from the stamp web.

It is another object of this invention to provide a stamp vending apparatus having electrical contacts positioned on opposite sides of the stamp web that make electrical contact as each row of perforations pass between the contacts and actuate a counting circuit that controls the drive wheel and stops its rotation when the preselected number of stamps have passed the contacts.

It is another object and feature of this invention to provide apparatus that dispenses a preselected number of stamps from a stamp web roll and that reduces the load on the web when the web is initially accelerated from rest to vending speed.

It is another object of this invention to provide stamp dispensing apparatus that moves the stamp web by passing it between two wheels and that moves one of the wheels out of engagement with the web when the apparatus is not in operation. This is a particularly important feature when the stamps are gummed on one side, which is usually the case, since it avoids the possibility of the gummed side of the stamps sticking to one of the wheels with the result that the stamp web would be torn or damaged when the wheels begin to turn during the next dispensing operation.

These and other objects, advantages, and features of this invention will be apparent to those skilled in the art from a consideration of this specification, including the attached drawings and appended claims.

The invention will now be described in detail in connection with the attached drawings in which,

FIG. 1 is a side view, in elevation, of the preferred embodiment of the stamp dispensing apparatus of this invention, with the outer case or housing removed;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 1;

FIG. 5 is a partial front view of the apparatus of FIG. 1 as indicated by the arrows 5—5 of FIG. 1;

FIG. 6 is a circuit diagram of the control system for the apparatus of FIG. 1;

FIG. 7 is a side view on an enlarged scale of the portion of FIG. 2 indicated by arrows 6—6; and

FIGS. 8A and 8B show the stamp web drive wheels of the apparatus in their dispensing and non-dispensing positions, respectively.

Referring to FIG. 1, mounting plate 10 and its associated mounting flanges support the various components of the apparatus. Usually, all of the working parts are enclosed in a suitable case or housing having an opening through which the stamps are dispensed. The necessary operating levers, push-buttons and the like, are also mounted on the housing.

As viewed in FIG. 1, shaft 11 is attached to mounting plate 10 in the upper right hand quadrant of the plate. Shaft 11 is designed to support roll 12 of stamps. The web of stamps that forms the roll is unwound from the roll to feed stamps to the dispensing apparatus. The stamp web travels from roll 12 through the dispensing apparatus along the path indicated by dotted line 13. It first passes around roller 14, where it makes about a 90° turn and then to roller 15 where it enters vertical guide track 16. This track has an elongated T-shaped slot (FIG. 2) formed by backplate 16a and two vertical rails 17a and 17b through which the stamp web passes. Toward the lower end of the track, rails 17a and 17b terminate, and backplate 16a curves as shown in FIGS. 1 and 6 to discharge the web from the track in a substantially horizontal direction. Roller assembly 20 is positioned to guide the stamp web as it makes this approximately 90° turn before beginning its horizontal travel toward the dispensing opening in the housing (not shown) of the apparatus.

The stamp web is supported next by track assembly 22. As best seen in FIGS. 3 and 4, this assembly includes U-shaped base 23 that is attached to bottom flange 24 of the mounting plate. The inside surface of arms 23a and 23b of the base have parallel horizontal

grooves to receive and support plate 25. The grooves in the arms and plate 25 form a T-shaped groove or passageway that guides and supports the stamp web as it moves horizontally along the track.

Means are provided to move the stamp web the desired distance each time the apparatus is actuated. In the embodiment shown, drive wheel 26 is positioned above the stamp web, and above an opening in plate 25, as shown in FIGS. 1 and 3. Idler wheel assembly 27 is positioned below the web and drive wheel 26. It includes roller 27a and movable wheel 27b. Roller 27a is mounted to freely rotate around the longitudinal axis of shaft 28. The shaft extends between and is supported by arms 23a and 23b. Movable wheel 27b is mounted to freely rotate around the longitudinal axis of shaft 29. Arms 23a and 23b have elongated slots 30 through which shaft 29 extends. These slots are designed to allow the shaft to be moved and, in turn, to move the wheel between the dispensing position shown in FIG. 8A, where the stamp web is engaged between the drive and idler wheels, and the non-dispensing position shown in FIG. 8B, where the idler wheel has moved out of engagement with the stamp web. Such movement is imparted to wheel 27b by the stamp web cutting apparatus that severs the stamp or stamps being dispensed from the stamp web.

When the stamp web has been moved the desired distance, the portion to be dispensed, whether one stamp or several, is severed from the rest of the stamp web by knife blade 31 moving downwardly through the stamp web past stationary blade 32. As shown in FIGS. 1 and 5, movable blade 31 is pivoted at one end to stationary blade 32 by pin 33. The other end is pivoted to plate 34 by pin 35. Plate 34 is mounted on front flange 10a of mounting plate 10 by screws 34a and 34b. The screws extend through elongated mounting holes that allow limited vertical movement of the plate relative to flange 10a. The plate is moved upwardly by solenoid 36 through link 37 to pivot movable blade 31 upwardly away from stationary blade 32. Elongated opening 35a allows pin 35 enough lateral movement relative to plate 34 for such pivotal movement. Solenoid 36, when energized, moves blade 31 up at the start of the vending operation against spring 38. At the end, it is de-energized and spring 38 moves blade 31 back to the closed position, cutting the stamps to be dispensed from the stamp web.

As stated above, in the embodiment shown, the movement of idler wheel 27b into and out of engagement with the stamp web is provided by the web cutting apparatus. As best seen in FIG. 3, shaft 29 is supported at each end by members 39a and 39b. Coil springs 40a and 40b are connected between members 39a and 39b and plate 34. When solenoid 36 is energized at the start of a dispensing operation, plate 34 is moved upwardly and springs 39a and 39b move idler wheel 27b into engagement with the stamp web below drive wheel 26 and roller 27a. Preferably, the point of contact between roller 27a and the idler wheel is located so that clockwise rotation of the drive wheel will tend to urge the idler wheel further between the drive wheel and the roller and thereby increase the force the idler wheel exerts on the stamp web and the drive wheel. The roller should be positioned, however, so that the idler wheel does not wedge between the roller and drive wheel so it is not free to return to its non-dispensing position. Angle A of FIG. 8A, if about 45°, is satisfactory for this purpose.

After the vending operation, the downward movement of the knife plate will allow the idler wheel to move to the position shown in FIG. 8B, out of engagement with the stamp web. By having the gummed side of the web toward the idler wheel, this removes the possibility of any sticking of the web to the wheel while the apparatus is inactive.

Preferably, the drive and idler wheels have rims of elastomeric material so they will grip the stamp web firmly, with a resilient force. Means are provided to rotate drive wheel 26. In the embodiment shown, the drive wheel is mounted on output shaft 41a of electric motor 41. As explained above, the stamp web must be moved a preselected distance during each operation to dispense the preselected number of stamps. This means that drive wheel 26 must rotate through the same angular distance each operation.

In accordance with this invention, means are provided that are responsive to the passage of each row of perforations as the web is moved to stop the drive wheel and the dispensing of stamps after a preselected number of stamps have been dispensed. In the embodiment shown, said wheel stopping means includes a counting circuit having a first contact positioned on one side of the stamp web and a second contact on the other side of the stamp web. The contacts make contact through the perforations as each row passes and actuate the counting circuit. The counting circuit includes means responsive to each electrical connection between the contacts to stop the rotation of the drive wheel when a preselected number of such contacts have been made.

In the embodiment shown, the first contact includes plate 25 as shown in FIG. 4 of track assembly 22. The second contact comprises brush 42 having a plurality of resilient, electrically conductive, bristles 42a that are bent against the top side of the stamp web above plate 25 as shown in FIG. 4. Being bent against the stamp web and plate 25, bristles 42a will be held out of electrical contact with plate 25 except when one or more of said bristles pass through one or more of the perforations in a row of perforations, as the row passes between the bristles and plate 25. Thus, as each row of perforations passes between the two contacts, an electrical connection will be made and then broken as the row of perforations passes beyond the bristles of brush 40. This arrangement will cause a series of electrical pulses to be produced, which can be used to count the number of stamps passing below or between the two contacts and can stop drive wheel 26 when a preselected number of said perforations have been counted.

As shown in FIG. 2, the brush is positioned, preferably, with the bristles extending across the web at an angle to its direction of travel to increase the length of time each row of perforations is under the bristles. Generally L-shaped brush mounting plate 47 supports the brush above the stamp web. The brush is attached to arm 47a of the plate that extends across the stamp web and track 22. Arm 47b of the plate is attached to mounting plate 10 by bolts 47c that extend through an elongated opening or slot in mounting plate 10. This arrangement allows the position of the brush relative to the cut off knife blades to be adjusted to accommodate stamps having different distances between perforations. The force with which the bristles of the brush push down on the stamp web is controlled by arm 60 that is pivotally connected to the bottom of the brush

by hinge 61 (FIG. 1). End 60a of the arm engages the bristles and the other end 60b engages adjusting screw 62 that is supported by bracket 63 attached to mounting plate 10 (FIG. 4). By changing the position of adjusting screw 62, the amount of bend in the bristles can be adjusted which adjusts the force exerted on the stamp web by the bristles. Another advantage of this arrangement appears when threading a stamp web under the bristles when a new stamp roll is being placed in the machine. By pressing down on end 60b, the bristles can be bent upwardly away from track 22 far enough to allow a stamp web to be positioned on the track without interference from the brush.

The electrical circuitry of the apparatus is shown in FIG. 6. As shown, the apparatus is designed to be operated by the deposit of one or more coins of a predetermined monetary amount. For example, the apparatus may be arranged to dispense one 8 cent stamp for the deposit of ten cents. Stepper switch 43 is stepped once for each pulse coming from coin operated pulser 43. It can be adjusted as desired to require the desired coins before it provides the apparatus with power. For example, as shown, switch 43 must be stepped five times by coin operated pulser 53 to move contact 43a into position to connect pushbutton switch 44 with a source of power. This could be the result of the deposit of 25 cents to buy three eight cent stamps.

The stamp purchaser, after having deposited the required number of coins, will then push an actuating lever, such as pushbutton 44, to obtain his stamps. This supplies power to relay 45, which closes switch 46 supplying power to motor 41 and solenoid 36. The solenoid moves blade 31 upwardly, and idler wheel 27b into engagement with the drive wheel, as motor 41 rotates the drive wheel. As each row of perforations passes between plate 25 and the bristles of brush 42, power is supplied to stepper switch 48. Stepper switch 48 is preset to complete the circuit to relay 49, when a preselected number of rows of perforations have passed between contacts 25 and 42. Assume, for example, that the apparatus is vending three 8 cent stamps per operation, as explained above then, stepper switch 48 would be arranged to energize relay 49 when it has received three pulses from contact 42. When relay 49 is energized, it will open switch 50, stopping motor 41 and de-energizing solenoid 36. This allows movable knife blade 31 to cut three stamps off the stamp web.

Switch 52 is the "last stamp switch." It is located at any convenient place to be held closed by the stamp web. As the end of the web passes the switch it will open. This will not stop the dispensing operation in process, because of loop 45a that locks this relay closed independently of power through switch 52, but it will prevent any other purchases from being made.

When motor 41 is first energized, drive wheel 26 and idler wheel 27b are brought up to speed very quickly to move the desired number of stamps past the cut off knives. This means that the stamp web itself is accelerated rapidly from a position of rest to the peripheral speed of the drive wheel. If the stamp web was taut between the drive wheel and the roll of stamps on shaft 11, it is possible that the inertia of roll 12 would be enough to cause the stamp web to break due to the rapid acceleration and initial tensile load imposed on the stamp web by drive wheel 26. Usually, however, because of its inertia, roll 12 will continue rotating briefly after the movement of the stamp web between the drive

wheel and the idler wheel is stopped. This will provide some slack between the roll of stamps and the drive wheel, which will tend to lessen the chance of pulling the stamp web apart at the start of a vending operation.

It is another feature of this invention to provide means to take advantage of this slack and to act as a shock absorber between the drive wheel and the roll of stamps being dispensed. In FIG. 7, roller assembly 20 is shown on an enlarged scale, along with the lower end of track 16 and the right hand end of track 22. Back-plate 16a of track 16 curves approximately 90° to direct stamp web 13, shown dotted, toward horizontal track 22. Deflector plate 22a extends from the forward end of track 22 to below the end of plate 16a to guide the stamp web toward track 22, when the stamp web is being threaded initially into position for vending.

Roller assembly 20 includes roller 54 that is mounted to rotate around the longitudinal axis of shaft 56. Encircling roller 54 is a second roller 58 having an internal diameter substantially larger than the outside diameter of roller 54. During a vending operation, the tension in the stamp web will pull roller 58 into engagement with roller 54 to guide the stamp web as it makes a substantially 90° turn and leaves roller 58 in line with the opening in track 22. After the vending operation as stated above, stamp roll 12 will usually continue rotating putting some slack in the stamp web between the roll and the drive wheel. This slack allows roller 58 of roller assembly 20 to move downwardly to the position shown in FIG. 6, and out of contact with roller 54. Then, when the next stamp or stamps are dispensed the initial acceleration of the stamp web will first move roller 58 upwardly into engagement with roller 54 and in doing so, due to the weight of roller 58, allow the stamp web to be brought up to or near its final speed as roller 58 is moving into engagement with roller 54. This tends to reduce the tendency of the web to break.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the apparatus of this invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. Apparatus for dispensing stamps and the like from an elongated web of said stamps having a longitudinally spaced transverse row of perforations between each stamp, comprising a drive wheel to engage the stamp web and dispense one or more stamps from the apparatus when the drive wheel is rotated, means for rotating the drive wheel to dispense the stamps, and means for stopping the rotation of the drive wheel when a preselected number of stamps have been dispensed, said stopping means including counting means located adjacent the moving stamp web and actuated by the passage of each row of perforations to stop the drive wheel

when a preselected number of said rows have passed, said apparatus being further provided with a housing having an opening through which the stamps are dispensed in a substantially horizontal direction, means supported by the housing for mounting a stamp web roll above the level of the dispensing drive wheel for the web to be unwound from the roll and dispensed by the drive wheel, and means for guiding the web from the roll to the drive wheel including a guide roller assembly around which the direction of travel of the stamp web is changed to the substantially horizontal direction it is traveling when dispensed, said assembly comprising a first idler roller mounted on the housing for rotation around a fixed axis of rotation and a second idler roller supported for rotation by the first idler roller, said second roller comprising a ring encircling the first roller and having an internal diameter substantially larger than the outside diameter of the first roller for movement downwardly with the web as slack is placed into the web between the drive wheel and the stamp roll after each vending operation and for movement upwardly into engagement with the first idler roller at the beginning of a dispensing operation to reduce the possibility of the web being broken when the drive wheel first begins to rotate to dispense stamps.

2. Apparatus for dispensing stamps from an elongated web of said stamps having a transverse row of perforations between each stamp comprising a housing having an opening through which the stamps are dispensed, a drive wheel and an idler wheel to engage the stamp web therebetween and move the web through the opening when the drive wheel is rotated, means for rotating the drive wheel, means for actuating the drive wheel rotating means when a coin or coins of a preselected value are deposited in the housing, means responsive to the passage of each row of perforations as the web is moved through the dispensing opening of the housing to stop the drive wheel and the dispensing of stamps after a preselected number of stamps have been dispensed, said drive wheel stopping means including circuit means having first and second contacts positioned on opposite sides of the stamp web to be electrically insulated from each other by the imperforate portions of the stamp web and electrically connected when a row of perforations passes between the contacts, one of said contacts comprising a brush having bristles of resilient electrically conductive material that are bent against one side of the stamp web for one or more of the bristles to extend through one or more of the perforations as each row passes between the contacts to make electrical contact with the other contact, means responsive to a preselected number of electrical connections between the contacts to stop the drive wheel, means supported by the housing for mounting a stamp web roll from which the web is unwound as stamps are dispensed by the drive wheel, means for guiding the

stamp web from the roll to the drive wheel and including a roller assembly around which the web makes a substantial change in direction before it reaches the drive wheel, said roller assembly comprising a first idler roller mounted on the housing for rotation around a fixed axis of rotation and a second idler roller supported for rotation by the first idler roller, said second roller comprising a ring encircling the first roller and having an internal diameter substantially larger than the outside diameter of the first roller for movement downwardly with the web as slack is placed into the web between the drive wheel and the stamp roll after each vending operation and for movement upwardly into engagement with the first idler roller at the beginning of a dispensing operation to reduce the possibility of the web being broken when the drive wheel first begins to rotate to dispense stamps.

3. Apparatus for dispensing stamps from an elongated web of said stamps having a transverse row of perforations between each stamp comprising a housing having an opening through which the stamps are dispensed, a drive wheel and an idler wheel to engage the stamp web therebetween and move the web through the opening when the drive wheel is rotated, means for rotating the drive wheel, means for actuating the drive wheel rotating means when a coin or coins of a preselected value are deposited in the housing, and means responsive to the passage of each row of perforations as the web is moved through the dispensing opening of the housing to stop the drive wheel and the dispensing of stamps after a preselected number of stamps have been dispensed, said apparatus being further provided with means mounting the idler wheel for movement between a dispensing position to engage the stamp web between the idler wheel and the drive wheel to move the stamp web when the drive wheel is rotated and a non-dispensing position out of engagement with the stamp web and means for moving the idler wheel to its dispensing position when the means for rotating the drive wheel is actuated and for moving the idler wheel to its non-dispensing position when the drive wheel rotating means is deactuated.

4. The apparatus of claim 3 further provided with an idler roller, means mounting the roller to rotate around a fixed axis parallel to the axis of rotation of the idler wheel and positioned to engage the idler wheel when the idler wheel is in its dispensing position, said roller being spaced from the drive wheel a distance such that the idler wheel will be urged further between the roller and the drive wheel to increase the force the idler wheel exerts on the stamp web and the drive wheel and yet be free to move out of engagement with the drive wheel and return to its non-dispensing position when the drive wheel stops rotating.

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