Sept. 3, 1968 H. B. VROOM 3,400,255

COUNT TRANSFER SYSTEM

Filed Jan. 5, 1965 3 Sheets-Sheet 1

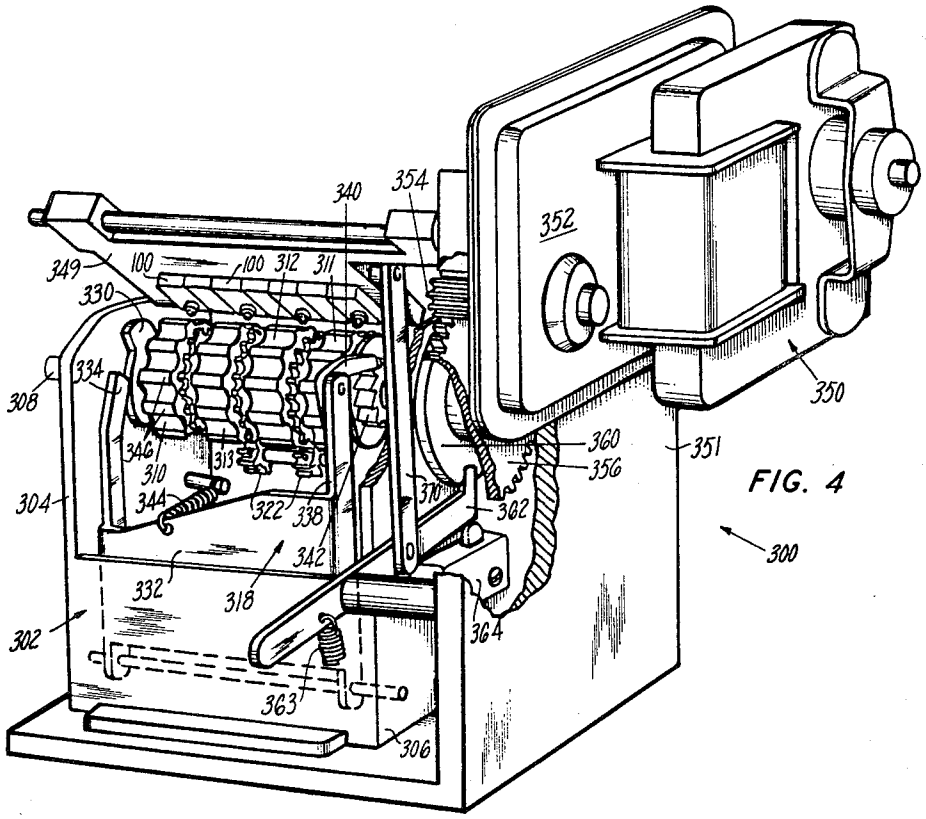
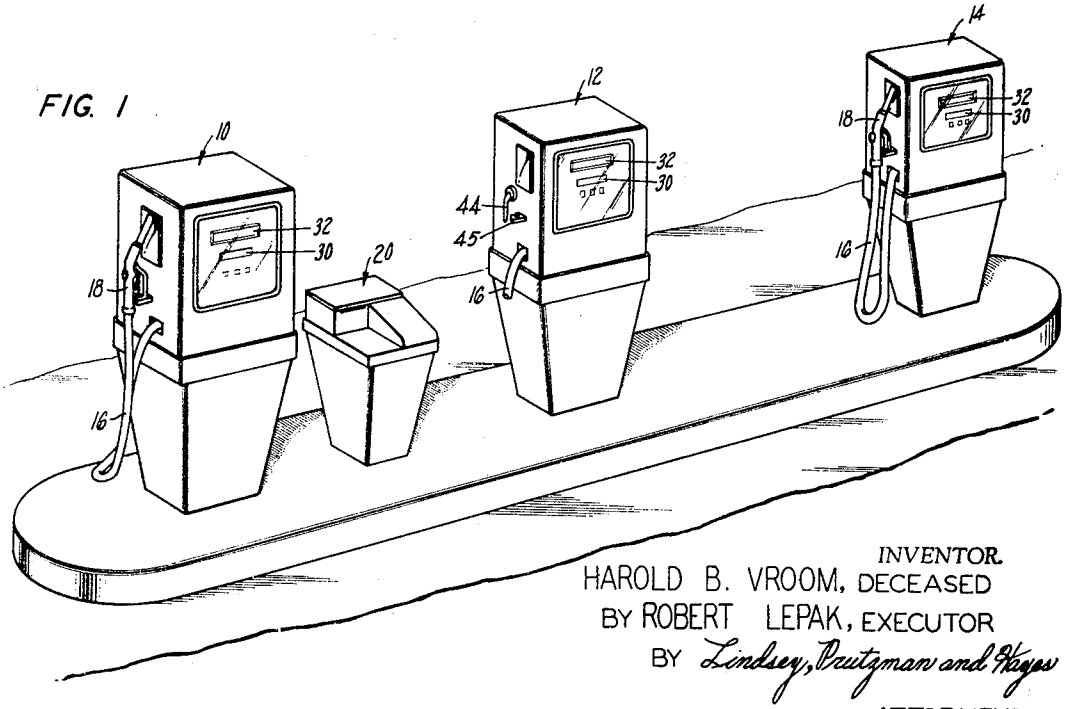


FIG. 4

FIG. 1



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COUNT TRANSFER SYSTEM

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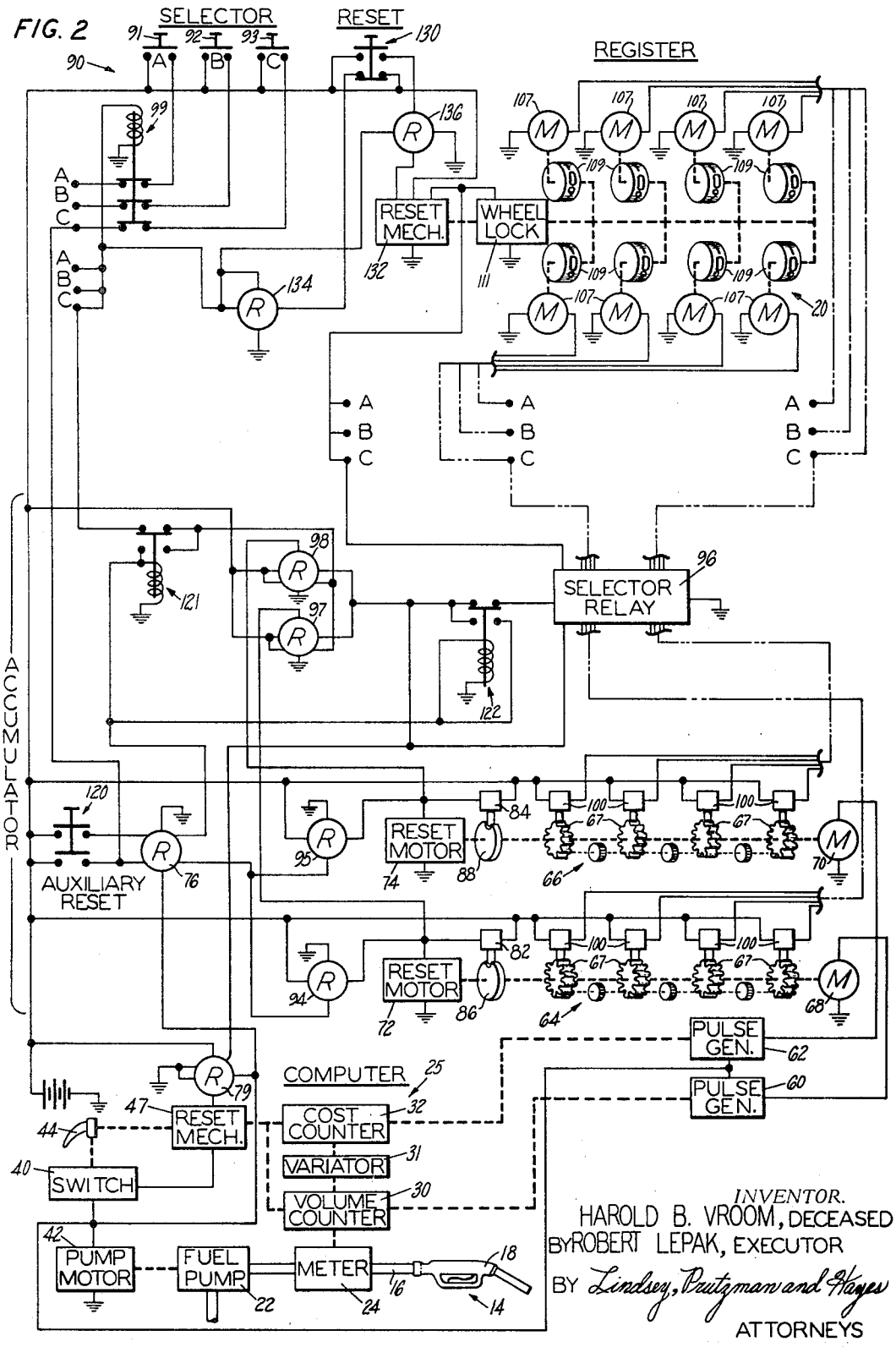
FIG. 2



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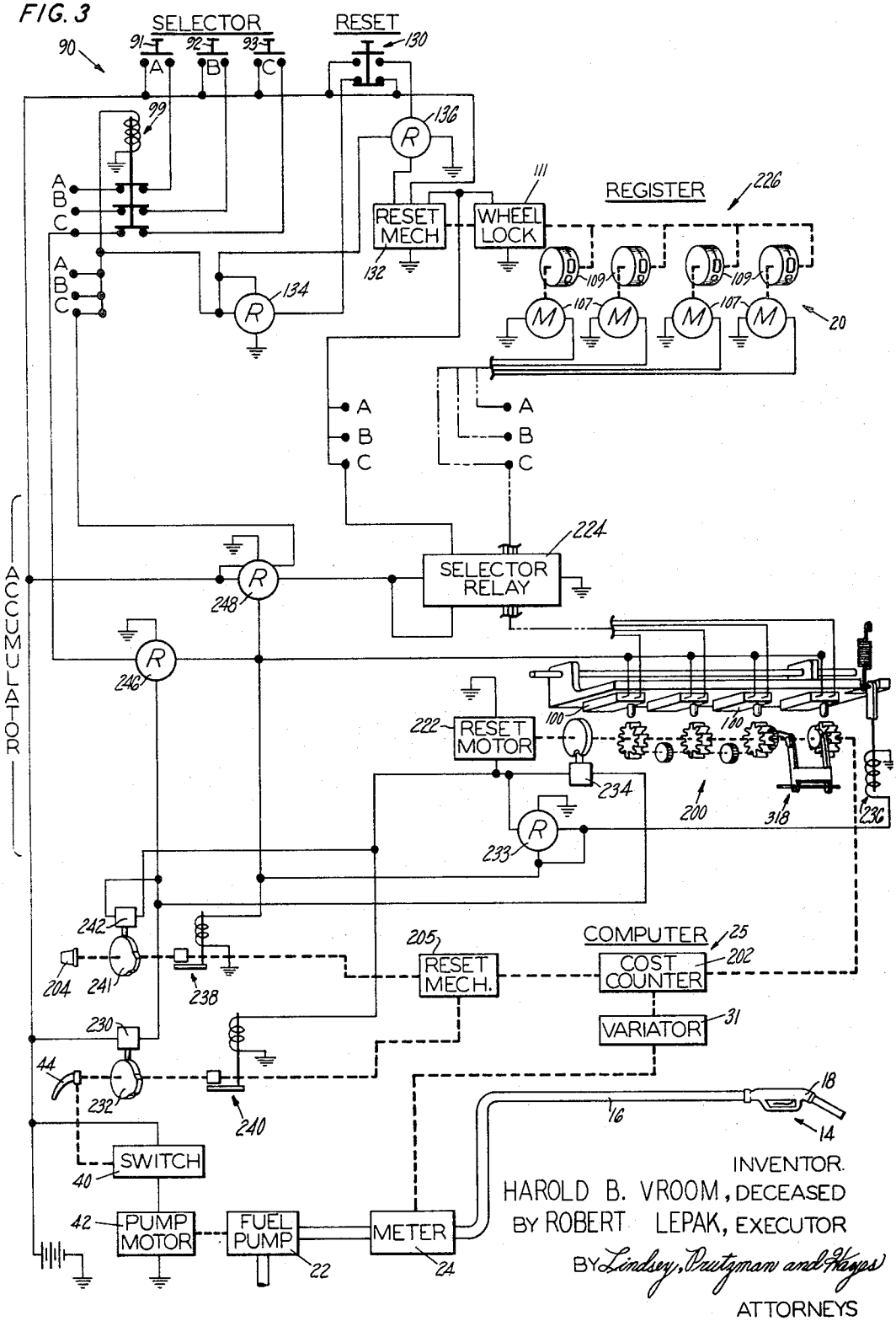
COUNT TRANSFER SYSTEM

Filed Jan. 5, 1965 3 Sheets-Sheet 3

FIG. 3



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3,400,255

COUNT TRANSFER SYSTEM

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23 Claims. (Cl. 235—92)

ABSTRACT OF THE DISCLOSURE

A fuel dispensing system having a plurality of fuel pumps, a storage counter for each of the fuel pumps having a plurality of rotatable storage elements for storing the cost or volume of the fuel dispensed, and a single printing register having a plurality of rotatable printing wheels corresponding to the plurality of rotatable storage elements respectively and connected to be individually indexed by stepping motors as a selected storage counter is reset to an initial or zero angular position. Each one of the rotatable storage elements has a plurality of cam lobes and an associated switch adapted to be actuated by the cam lobes as the storage element is reset in the counting direction to zero, and the number of electrical pulses thereby generated provides for stepping the corresponding printing wheel in the subtracting direction a number of times which is proportional to the resetting angular displacement of the storage element. Selecting means is provided for individually resetting the storage counters and for thereby transferring the count of the selected storage counter to the printing registers, and sequencing or interlock means is provided for maintaining the associated fuel pump inoperative for delivering fuel until after the associated storage counter is reset.

The present invention relates to the registration of a number count or the like and is more directly concerned with a counting and registering system adapted for counting and for registering the count after the counting operation is completed.

It is a primary aim of the present invention to provide a system which is adapted for selective registration of the counts of a plurality of counting devices. In connection with this aim, the counting and registering system of the present invention has notable utility in gasoline stations for selective registration of the volume and/or the cost of gasoline dispensed from each gasoline pump. Such is useful for example where the registration of this information is desired at a point removed from the gasoline pumps and/or where the system is employed in connection with credit purchases of gasoline for printing on a sales record the total cost and/or volume of the gasoline dispensed.

It is another aim of the present invention to provide a new and useful system for storing the volume and/or cost information of each fuel delivery and for selectively transferring the stored information to a register where the information may be visually observed and noted or the information may be employed to print a record of the cost and/or volume of the delivery.

It is a further aim of the present invention to provide an improved system for recording credit purchases of gasoline at automobile service stations.

It is a still further aim of the present invention to provide a system adapted for storing information in a number of independently operated counters of the type having a number of rotatable counter wheels of increasing order and for transferring the information stored in the counters to a single register of the type having a plurality of rotatable indicia bearing wheels of increasing order and wherein the information transferred from

the counters to the register can be controlled to effect independent registration of the information stored in each of the counters.

It is another aim of the present invention to provide a counting and registering system having a counting device that can be operated with a minimum driving torque and which may therefore be effectively driven by the relatively low torque drive of the usual volumetric flow meter of conventional gasoline pumps for effecting a count of the volume and/or cost of the gasoline dispensed from the pump.

It is a further aim of the present invention to provide an improved counting and registering system incorporating a register with print wheels that are rotated to provide a concise and reliable print of a number count or the like without the usual prior "inching" of one or more of the print wheels to align the wheels for printing.

It is a still further aim of the present invention to provide an improved counting and registering system which is useful with high speed counting.

It is another aim of the present invention to provide a new and improved counting and registering system having a number of counters that are driven to provide independent counting functions and a register located remotely from the counters for selectively registering the counts of the counters.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth, and the scope of the application of which will be indicated in the appended claims.

In the drawings:

FIG. 1 is a perspective view, partly broken away, showing an installation of a counting and registering system of the present invention employed in a typical gasoline station;

FIG. 2 is a partial schematic representation of the installation of FIG. 1 showing an embodiment of the counting and registering system of the present invention;

FIG. 3 is a partial schematic representation generally similar to the schematic representation of FIG. 2 showing another embodiment of the counting and registering system of the present invention; and

FIG. 4 is an enlarged perspective view, partly broken away and partly in section, of an embodiment of a storage unit which may be employed in the embodiments of the counting and registering system of the present invention of FIGS. 2 and 3.

Referring now to the drawings in more particularity wherein like parts have like numbers, the counting and registering system of the present invention has notable usefulness for remotely registering the volume and/or cost of the gasoline dispensed from one or more gasoline pumps, and accordingly for purposes of illustration a gasoline station is shown in part in FIG. 1 with three gasoline pumps **10**, **12**, **14** that are adapted in the well-known manner for dispensing gasoline via a pump hose **16** and nozzle **18**, and with the counting and registering system of the present invention being employed for selectively printing with a printer **20** the volume and the cost of the gasoline dispensed from the gasoline pumps, as for example for providing a record of credit purchases.

Referring now to FIG. 2, a partial schematic representation of an embodiment of a counting and registering system of the present invention is shown with terminals, designated A, B and C, for connection to subsystems of the counting and registering system associated with the gasoline pumps **10**, **12**, **14**, respectively. For simplicity of explanation, however, only the C designated termi-

nals are shown connected to a subsystem of the counting and registering system associated with the gasoline pump **14** and it should be understood that the A and B designated terminals are to be similarly connected to similar subsystems (not shown) associated with the gasoline pumps **10** and **12**.

The gasoline pump **14** is schematically shown having a fuel pump **22** and a fuel meter **24** for measuring the quantity of gasoline dispensed by the pump through the outlet nozzle **18**. In a well-known manner the meter **24** is adapted to drive the usual pump computer **25** which conventionally includes a visual volume or gallon counter **30** and suitable variator gearing **31** for driving a visual cost or dollar counter **32**. In a conventional manner an electric switch **40** is provided for the usual pump motor **42** and a manually operable pump control lever **44** is provided for closing the switch **40** when the lever is pivoted to an "ON" position, which in the conventional installation can be accomplished only after the pump nozzle **18** is removed from the usual nozzle receptacle **45** (FIG. 1) in the pump housing. The pump control lever **44** when pivoted to its "ON" position also actuates a suitable reset mechanism **47** that is electrically operated for resetting the volume and cost counters **30, 32** and which is adapted to automatically energize the pump motor **42** after the volume and cost counters have been fully reset, as for example as disclosed in United States Patent 2,626,082 of Harvey N. Bliss et al. entitled Resetting and Interlock Mechanism for Liquid Dispensing Apparatus.

In accordance with the embodiment of the present invention of FIG. 2, the pump computer is connected for driving electrical pulse generators **60, 62** simultaneously with the visual volume and cost counters **30, 32**, respectively, preferably so as to provide an electrical pulse for each count registered on the lowest order number wheel of the respective volume and cost counters. The pulse generators thereby provide a digital measure of the cost and volume of the gasoline dispensed and with the same degree of accuracy provided by the volume and cost counters. Accordingly, with the usual pump computer adapted for registering the gasoline cost within an accuracy of one cent and for registering the gasoline volume within an accuracy of one-tenth of a gallon, the pulse generators **60, 62** will provide a pulse for each one cent of the cost and a pulse for each one-tenth gallon of the volume of the gasoline dispensed. Additionally, for greater accuracy it is preferred that the pulse generators are connected to the computer so that pulses are generated as the lowest order number wheels of the visual counters are rotated halfway through their respective one cent and one-tenth gallon counts.

The pulse generators are shown connected in parallel with the pump motor **42** and are therefore conditioned for generating pulses only when the fuel pump motor is energized. A pair of accumulators or storage counters **64, 66** having storage counter wheels **67** are indexed by a pair of stepping motors **68, 70** which are electrically connected to the pulse generators **60, 62** to index the storage counters in step-wise or digital fashion simultaneously with the visual volume and cost counters **30, 32** and thereby continuously store the count registered by the visual counters. Also, electrical reset motors **72, 74** are provided for the cost and volume storage counters **64, 66**, respectively, for resetting the storage counters independently of the visual counters **30, 32**.

A register subsystem of the counting and registering system comprises a manual selector, generally denoted by the numeral **90**, shown having three push button selector switches **91–93**, designated A, B, and C, for selecting the corresponding accumulator subsystems. With the selection of the accumulator subsystem shown in FIG. 2 by depressing push button switch **93**, a pair of relays **94, 95** are momentarily energized to energize the reset motors **72, 74** and, through one or both of the relays **97, 98**, to energize a selector relay **96** to electrically connect the selected accumulator subsystem with the register subsystem. After the reset motors **72, 74** are momentarily energized by the selector button **93**, the storage reset motors **72, 74**, and accordingly the selector relay **96**, are maintained energized by switches **82, 84**, respectively, which are operated by suitable cams **86, 88** on the reset motor shafts to maintain the switches closed for one revolution of the counter reset shafts respectively to fully reset the storage counters, whereupon the circuits through the switches **82, 84** are broken to de-energize the reset motors **72, 74** and the selector relay **96**. Each of the storage counter wheels **67** of the volume and cost storage counters **64, 66** has an associated switch **100** and the storage wheels **67** are formed with a number of angularly spaced cam lobes, preferably equal to the number of indicia, conventionally ten, on the corresponding visual counter wheel of the visual counter, to actuate the associated switch **100** a number of times that is substantially directly proportional to the angular displacement of the storage wheel as it is reset to its initial or zero position by the reset motor. Accordingly, when the storage counters are reset, the switches **100** are actuated a number of times which is a function of the count stored in the associated storage wheel.

The switches **100** are electrically connected through the selector relay **96** to corresponding stepping motors **107** respectively which are mounted for independently indexing print wheels **109** of the printer **20**, it being seen therefore that the print wheels **109** will be simultaneously indexed in incremental or digital fashion by the electrical pulses which are transmitted by the switches **100** to the stepping motors **107**. Also, the print wheels are indexed a number of counts which is substantially directly proportional to the angular displacement of the corresponding storage wheel as it is reset to zero. The printer **20** thereby functions as a registering device for printing the volume and the cost of the gasoline dispensed from the pump associated with the selected accumulator sybsystem and is accordingly provided with two banks of axially aligned print wheels corresponding in number to the number of storage wheels in the volume and cost storage counters **64, 66**, respectively. A print wheel lock **111** is provided for locking the print wheels in their properly aligned indexed positions for printing and a suitable lock release solenoid (not shown) is energized when the selector relay **96** is energized to release the wheel lock and thereby allow for transferring the count to the printer.

It is preferred that the storage wheels **67** are reset in the counting direction to provide for using a simple override arrangement for mechanically disconnecting the drive motors **68, 70** when the reset motors **72, 74** are operated, and vice versa, in which case the number of impulses or counts transferred to each print wheel will amount to ten minus the count stored in the corresponding storage wheel. The print wheels are therefore incrementally driven by the stepping motors **107** in the subtracting direction to properly index the print wheels to a position which will properly register the stored counts in the corresponding storage wheels. For example, if the stored count in a storage wheel were 7, three impulses would be generated by the associated switch **100** as the storage wheel is reset to zero, and the corresponding print wheel would therefore be indexed in the subtracting direction from 0 to 9 to 8 to 7 with the three impulses.

A reset relay **76** is provided in the accumulator subsystem to prevent operation of the reset motors **72, 74** during the delivery of fuel and until after the pump motor **42** has been de-energized by pivoting the manual control lever **44** to its "OFF" position. Additionally, by the provision of a suitable sequence relay **79**, after the fuel delivery is completed and the manual control lever **44** is placed in the "OFF" position the reset mechanism **37** is preferably de-energized until after the volume and cost storage counters **64, 66** have been completely reset. Ac-

cordingly, the storage counters cannot be reset until after the fuel delivery has been completed and the fuel cannot be subsequently delivered until after the storage counters have been reset. An auxiliary reset button **120** may be provided, however, for momentarily energizing the reset relays **94**, **95** and thereby energize the reset motors **72**, **74** in the manner of the selector button **93** and for momentarily energizing a pair of holding relays **121**, **122** for disconnecting the accumulator subsystem from the register and for maintaining the selector relay **96** de-energized during this auxiliary resetting of the storage counters. Such an auxiliary reset button **120** could be located, for example, at the gasoline pump associated with the accumulator subsystem so that the storage counters could be reset at the pump as for a cash sale or in general where it is not considered desirable to transfer the stored count to the register.

A selector deactivating relay **99** is shown provided to deactivate the selector **90** until after the storage counters **64**, **66** of the selected accumulator subsystem have been fully reset and the reset motors **72**, **74** and consequently the selector relay **96** have been de-energized. The register is resettable with a push button reset switch **130** for momentarily energizing a reset mechanism **132** which functions to energize the wheel lock release solenoid to unlock the register wheels and to reset them to zero. A relay **136** is employed to deactivate the reset switch **130** until after the transfer of the count from the storage wheels to the register wheels has been completed, and a holding relay **134** functions to maintain the selector deactivating relay **99** energized until after the count has been completely transferred from the selected accumulator subsystem to the register and until after the reset switch **130** is actuated to energize the register reset mechanism **132**.

In the described embodiment of FIG. 2 the storage counters **64**, **66** are electrically connected for simultaneous operation with the cost and volume counters of the pump computer, and where such is used in connection with the dispensing of gasoline, the usual gasoline pump can be readily modified for connection to the accumulator subsystem simply by the incorporation of the pulse generators **60**, **62** and by preferably encasing the pulse generators in a suitable explosion-proof housing. Moreover, the entire accumulator subsystem excepting for the pulse generators **60**, **62** could be conveniently located remotely from the gasoline pump and where desirable could be mounted in a single package with the register subsystem as where the register is employed as in the illustrated installation of FIG. 1 for printing the cost and/or volume of gasoline credit sales. Alternatively, the register could be conveniently located in an appropriate office for remote registration of the cost and/or volume of each delivery. Such an installation, for example, would be useful in self-service gasoline stations or where remote registration for other administrative reasons was desirable.

Referring now to FIG. 3, another embodiment of the counting and registering system of the present invention is shown with an accumulator subsystem having a storage counter **200** mechanically coupled for simultaneous operation with the visual cost counter **202** of the gasoline pump computer, there being shown for simplicity only a single visual counter **202** and a single storage counter **200**, although of course more than one storage counter could be employed in the accumulator subsystem in the manner of the embodiment of FIG. 2. Apart from the direct mechanical drive of the storage counter **200**, the accumulator subsystem could be substantially identical to the accumulator subsystem of the embodiment of FIG. 2 and be identically connected with the register; however, the embodiment of FIG. 3 is provided with several additional modifications to show an alternative accumulator subsystem having utility with a fuel pump having a mechanical reset mechanism for the pump computer vice the electrical reset mechanism schematically shown in FIG. 2. The fuel pump is schematically shown in FIG. 3 having a manual control knob **204** for actuating the mechanical reset mechanism which may be of the type, for example, shown and described in United States Patent No. 2,836,363 of Otto Wild, Jr. entitled Counter Resetting Means, and which is adapted to reset the visual counter **202** after the manual control handle **44** has been pivoted to its "OFF" position from its "ON" position where the pump motor **42** is energized by the switch **40** for conditioning the pump for delivering fuel.

The accumulator subsystem is provided with a suitable electrical reset motor **222** for resetting the storage counter **200** and with a suitable selector relay **224** for electrically connecting the switches **100** of the storage counter with the stepping motors **107** of the register in the manner of the embodiment of FIG. 2.

To provide an interlock for preventing resetting of the storage counter **200** until after the fuel delivery is terminated by pivoting the manual control handle **44** to its "OFF" position, a switch **230** actuated by a cam **232** is operated by the handle **44** to energize the electrical circuit of the accumulator subsystem when the handle **44** is in its "OFF" position. For resetting the storage counter **200** and for simultaneously transferring the stored count of the storage counter to the register **226** the appropriate push button switch **93** of the selector switch **90** is depressed for momentarily energizing through a holding relay **233** the accumulator reset motor **222**. The reset motor is thereafter operated through a full one-revolution reset cycle for resetting the storage counter **200** by a one-turn cam operated switch **234**. Also, the switches **100** are shown pivotally mounted adjacent the storage counter wheels so as to be pivoted out of operative association with the storage counter wheels when the storage counter is being mechanically driven with the pump computer, thus reducing the torque required to drive the storage counter. When, however, the storage counter is reset by the appropriate push button switch **93** of the selector **90** to transfer the count in the storage counter to the register, a solenoid **236** is energized simultaneously with the energization of the reset motor **222** to pivot the switches **100** into operative association with the storage counter wheels for engagement by their cam lobes.

An interlock **238** is shown provided to prevent operation of the reset mechanism **205** while the count of the storage counter **200** is being transferred to the register, and an interlock **240** is shown provided to lock the manual control handle **44** in its "OFF" position while the storage counter is being reset. Also, a cam operated switched **242** which is momentarily actuated by a cam **241** as the knob **204** is pivoted to actuate the computer reset mechanism **205**, is shown provided to momentarily energize the storage counter reset motor **222**. The storage counter thereafter remains energized by the cam operated switch **234** to reset the storage counter without transferring the count to the register. Also, as in the accumulator subsystem of FIG. 2, a relay **246** is provided to electrically disconnect the selector **90** from the accumulator subsystem while the pump motor **42** is turned "ON" and a relay **248** is used to energize the selector relay **224** and to energize the deactivating relay **99** of the register selector **90** while a count is being transferred from the storage counter to the register.

Referring now to FIG. 4, an embodiment **300** of a storage unit which may be employed in the accumulator subsystem comprises a frame **302** with a pair of upstanding walls **304**, **306** supporting a rotatable storage counter reset shaft **308**. A plurality of storage counter wheels **310–313** are supported on the reset shaft **308** for rotation thereon in a counting direction, in the clockwise direction as viewing the storage unit from the right side as seen in FIG. 4, and for simplicity of design and operation, the storage wheels **310–313** are preferably designed for being reset by rotation of the reset shaft **308** through one complete revolution in the counting angular direction.

The particular storage counter shown is adapted for

being driven in analog fashion, for example as the storage counter **200** of the embodiment of FIG. 3 which is directly connected for simultaneous rotation with the lowest order counter wheel of the corresponding visual counter of the computer. Although the usual transfer pinions could be employed to provide for indexing all of the storage counter wheels of higher order than the lowest order wheel **310**, a transfer mechanism **318** is shown provided for digitally indexing the higher order wheel **311** while the usual transfer pinions **322** are provided for indexing the higher order wheels **312, 313**, it being understood however that the storage wheels are indexed in digital fashion with the storage wheel **314** due to the transfer mechanism **318**.

The transfer mechanism **318** comprises a spiral or involute jump cam **330** fixed for rotation with the lowest order storage wheel **310** and a cam actuated yoke **332** pivotally mounted on the walls **304, 306** of the frame and having a first finger **334** which functions as a cam follower to oscillate the yoke through one complete oscillation for each revolution of the jump cam and therefore for each revolution of the counter wheel **310**. A second finger **338** of the yoke pivotally supports a ratchet pawl **340** which is pivotally biased by a suitable spring (not shown) into operative engagement with a ratchet wheel **342** fixed for rotation with the storage wheel **311**. A tension spring **344** is provided for urging the follower **334** into engagement with the jump cam **330** and accordingly as the lowest order counter wheel **310** is rotated from its initial or zero position, the follower **334** is gradually pivoted outwardly to gradually withdraw the ratchet pawl **340**. After approximately a full revolution of the lowest order wheel **310** the follower **334** is instantaneously released to allow the tension spring **344** to pivot the yoke and index the storage wheel **311** one count. Accordingly, the transfer mechanism **318** provides a digital wheel drive with a minimum required torque that remains substantially constant during the operation of the storage counter.

The storage wheels **310–313**, in the manner of the embodiments of FIGS. 2 and 3, are provided with angularly spaced cam lobes **346** for operating the switches **100**. The switches **100** are shown mounted in a bank on a support **349** pivotally mounted on the walls **304, 306** of the frame and which is thereby adapted to pivot the switches into operative association with the storage wheels **310–313** for engagement by the cam lobes **346**. To ensure accuracy in transferring the count of the storage counter to the register, it is preferred that when the switches are pivoted into operative association with the storage counter wheels they are positioned between the cam lobes of the digitally driven higher order storage wheels **311–313**. Also, it is preferred that the jump cam **330** is positioned such that the digital transfer to the next higher order storage wheel **311** takes place as the lowest order storage wheel has moved exactly halfway between its nine (9) and zero (0) count positions, in which case it is also preferred that if the lowest order storage wheel **310** comes to rest at a position less than halfway between its full count positions, the number of pulses transmitted by the corresponding switch **100** would correspond to the lower count, and if the storage wheel should come to rest at a point beyond a halfway position, the number of pulses transmitted would correspond to the higher count.

An electric reset motor **350** is mechanically connected for driving the reset shaft through suitable reduction gearing including a gear box **352** mounted on an end wall **351** of the frame and a pair of intermeshing spur gears **354, 356**, the latter of which is fixed to the reset shaft **308**. A one-turn cam **360** is fixed to the reset shaft and in the storage unit of FIG. 4 a lever or cam follower **362** is shown pivotally mounted on the end wall **351** for actuating a reset switch **364** for energizing the reset motor. Accordingly, as an alternative to the embodiment of FIG. 3, by pivotal operation of the lever **362**, either manually or by a suitable solenoid (not shown), against a tension spring **363**, the reset switch **364** is actuated to energize the reset motor **350**. The cam **360** thereafter holds the lever **362** in engagement with the reset switch to maintain the reset motor energized for a full revolution of the reset shaft, whereupon the cam **360** releases the lever **362** to deactivate the reset switch **364**. The lever **362** is also shown mechanically connected to the pivotal support **349** by a link **370** and is accordingly adapted to mechanically pivot and thereafter retain the transfer switches **100** in operative association with the storage counter wheels **310–313** during the operation of the reset motor. This, of course, ensures that the transfer switches **100** are actuated as the storage counter wheels are reset to transfer the stored count to a suitable register.

Thus it can be seen that the counting and registering system of the present invention is adapted for storing one or more counts in a corresponding number of storage counters and to selectively transfer the stored counts to a register by parallel and simultaneous entry of the counts from the individual or digit storage elements of the selected storage counter to the corresponding register wheels. Such a counting and registering system has notable utility for independently storing, as for example, the cost and/or volume of credit sales of gasoline dispensed from a number of gasoline pumps and for selectively registering the cost and/or volume of the gasoline dispensed as for printing a permanent record of the credit sales or for remotely registering this data for other administrative purposes.

Morever, with the counting and registering system of the present invention a relatively high speed input to the storage counters can be accomplished with a minimum drive torque and can be converted to provide a relatively low speed readout or input to the reigster which may nevertheless be accomplished in a very short interval. Additionally, although the storage counter may be driven in analog fashion, the count is transferred to the register wheels in digital fashion to ensure accurate positioning of the register wheels and to avoid the necessity of "inching" the register wheels where they are employed for printing.

It is contemplated that the counting and registering system of the present invention has numerous applications of which the described installation of the system is a notable example. In such application the counting and registering system can be provided with suitable interlocks for ensuring the desired sequence of operations and to ensure, once the fuel delivery has been completed, that the stored count cannot be inadvertently lost or inadvertently or purposefully changed and that the count is accurately and properly transferred to the register.

Further, with the counting and registering system of the present invention the counts of a number of storage counters can be selectively transferred to the register and, accordingly, a single register, as for example a printer, can be conveniently employed to register the count of one of the storage counters while the remaining storage counters are operated by independently operated devices.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

What is claimed is:

1. A number counting and registering system comprising an accumulator subsystem having a storage counter with a plurality of rotatable storage elements of increasing place adapted for being angularly driven for storing a multiple place count, a register subsystem having a register with rotatable register wheels of increasing place corresponding to the storage elements of increasing place respectively and adapted for being individually indexed for registering the multiple place count, means for substantially simultaneously resetting the rotatable storage elements, and means for substantially simultaneously indexing the register wheels substantially proportionally

to the resetting angular displacement of the corresponding storage elements of the storage counter for transferring the multiple place count of the accumulator subsystem to the register subsystem.

2. The counting and registering system of claim 1 wherein the register wheels are coaxial printing wheels bearing a plurality of angularly spaced type operative for printing the multiple place count stored within the accumulator subsystem, and wherein the indexing means functions to digitally step the printing wheels to operatively position successive type thereon for printing.

3. A counting and registering system comprising an accumulator subsystem having a storage counter with a plurality of rotatable storage elements of increasing order adapted for being angularly driven from initial angular positions for storing a count, a register subsystem having a register with rotatable register wheels of increasing order corresponding to the rotary storage elements of increasing order respectively, electrical stepping motors for indexing the rotatable register wheels respectively, resetting means for angularly displacing the storage elements to their initial angular positions for zeroizing the accumulator, and electrical switching means for energizing the stepping motors a number of times which is substantially proportional to the resetting angular displacement of the corresponding rotatable storage elements for transferring the count of the accumulator subsystem to the register subsystem.

4. The counting and registering system of claim 3 wherein the electrical switching means comprises stepping motor switches for the storage elements respectively and wherein the rotatable storage elements have a plurality of angularly spaced switch actuators for operating the stepping motor switches as the storage elements are reset to their initial angular positions.

5. A counting and registering system comprising an accumulator subsystem having a storage counter with a plurality of rotatable storage elements of increasing place adapted for being angularly driven from initial angular positions for storing a multiple place count, a register subsystem having a register with rotatable register wheels of increasing place corresponding to the rotary storage elements of increasing place respectively, electrical motor means for individually indexing the rotatable register wheels, resetting means for angularly displacing the storage elements to their initial angular positions for zeroizing the accumulator subsystem, and electrical means for energizing the electrical motor means for individually indexing the rotatable register wheels simultaneously with and substantially proportional to the resetting angular displacement of the corresponding rotatable storage elements for transferring the multiple place count stored in the accumulator subsystem to the register subsystem.

6. A counting and registering system comprising a plurality of accumulator subsystems having first counters with a plurality of rotatable storage elements of increasing place, said first counters being adapted to be independently driven for storing a plurality of independent multiple place counts, and first electrical resetting means for individually resetting the first counters to zero, and a register subsystem with a second counter having rotatable indicia bearing wheels of increasing place corresponding to the rotatable storage elements of increasing place respectively, and selector means for energizing the first electrical resetting means for selectively resetting the first counters; said accumulator and register subsystems having electrical positioning means for individually indexing the indicia bearing wheels of the second counter substantially proportionally to the angular displacement of the rotatable storage elements of the first counters as they are selectively reset for transferring the multiple place count of the selected first counter to the second counter.

7. The counting and registering system of claim 6 further comprising second electrical resetting means for resetting the second counter, first electrical interlock means for preventing resetting of each of the first counters as it is being driven to store a multiple place count, and second electrical interlock means for operably deactivating the selected first counter as it is being reset to transfer the multiple place count stored therein to the second counter.

8. A counting and registering system for a gasoline station having a plurality of gasoline pumps, comprising; an accumulator subsystem for each of the gasoline pumps having a storage counter with a plurality of rotatable storage elements of increasing place, the storage counter being connected for counting the volume or cost of the gasoline dispensed by the pump, and resetting means for angularly displacing the rotatable storage elements for zeroizing the storage counter; and a register subsystem having a register with rotatable register wheels of increasing place corresponding to the rotatable storage elements of increasing place respectively, and selector means for activating the resetting means for selectively resetting the storage counters to zero; the register subsystem and the accumulator subsystem having transfer means for angularly displacing the register wheels substantially proportionally to the resetting angular displacement of the corresponding storage elements of the selected storage counter for transferring the multiple place count of the selected accumulator subsystem to the register subsystem.

9. The system of claim 8 wherein the register is spaced from the gasoline pumps and the transfer means comprises electrical motors for the register wheels respectively and motor switches for the motors respectively actuated by the corresponding storage elements of the storage counters.

10. In combination with a gasoline pump having a computer with a visual counter for registering the cost or the volume of the fuel dispensed with the gasoline pump, a counting and registering system for the gasoline pump comprising a storage counter connected for being driven simultaneously with the visual counter of the gasoline pump having a plurality of rotatable storage elements of increasing place adapted for continuously storing the count of the visual counter, a register having a plurality of individually rotatable print wheels of increasing place corresponding to the storage elements of increasing place respectively, resetting means for angularly displacing the storage elements for zeroizing the storage counter, electrical motors for digitally indexing the print wheels respectively, switches for the motors respectively pivotally mounted for movement between extended positions in operative association with the corresponding storage elements respectively and withdrawn positions, said storage elements having a plurality of angularly spaced switch actuators for actuating the switches when they are in their extended positions for generating electrical impulses for energizing the motors, and means for pivoting the switches to their extended positions for actuation by the corresponding storage elements during the resetting of the storage counter.

11. In combination with a plurality of gasoline pumps having visual counters respectively for registering the cost or volume of the gasoline dispensed from the pump, a counting and registering system comprising a plurality of accumulator subsystems in operative association with the gasoline pumps respectively; each of the accumulator subsystems having a storage counter operatively connected for simultaneous operation with the visual counter of the respective gasoline pump, the storage counter having a plurality of rotatable storage elements of increasing place to continuously store the count of the visual counter and an electrical reset motor for resetting the storage counter; a register subsystem having a plurality of rotatable register wheels of increasing place corresponding to the rotatable storage elements of increasing place, and electrical positioning means for individually indexing the register wheels; count transfer means associated with each storage element operable for energizing the electrical posi-

tioning means for individually indexing the register wheels in accordance with the angular displacement of the corresponding storage elements of the storage counters as they are reset to zero, and selector means for selectively energizing the electrical reset motors and for simultaneously transferring the count of the selected storage counter to the register.

12. The counting and registering system of claim **11** wherein the count transfer means associated with each storage element comprises a switch intermittently actuated by the associated storage elements while it is being reset, and wherein the selector means automatically activates the switches associated with the storage elements of the selected storage counter for energizing the electrical positioning means.

13. A system for registering a count comprising a counter having a plurality of resettable rotatable counter wheels of increasing place adapted for accumulating a multiple place count, drive means for driving the counter, means for substantially simultaneously angularly resetting the counter wheels, a register having a plurality of indicia bearing register members of increasing place corresponding to the counter wheels of increasing place and individually indexable for registering the multiple place count of the counter, electrical transfer means for transferring the count of each place counter wheel to the register member of corresponding place by parallel entry from the counter wheels to the corresponding indicia bearing register members during the resetting of the counter wheels and substantially proportionally to the resetting angular displacement thereof respectively, and interlock means for deactivating the counter drive means while the electrical transfer means is transferring the multiple place count from the counter to the register.

14. A system for selectively registering a count comprising a plurality of rotatable first counters adapted for being independently driven in counting angular directions for independent counting operations, said first counters each having a plurality of first counter wheels of increasing order, a rotatable second counter having a plurality of independently rotatable second counter wheels of increasing order corresponding to the first counter wheels of increasing order, resetting means for selectively resetting the first counters to zero by angular displacement of the first counter wheels in a counting angular direction, and transfer means for angularly displacing the second counter wheels in accordance with the angular displacement of the corresponding first counter wheels of the selected first counter as the selected first counter is reset to zero, said transfer means angularly displacing the second counter wheels in a subtracting direction an angular amount substantially equal to the angular displacement of the first counter wheels as they are reset to zero.

15. A counting and registering system for independently storing a number of multiple place counts in a number of resettable counters and for selectively registering the multiple place count of each counter, comprising a register adapted for registering a multiple place count, a plurality of rotatable storage counters adapted to be driven by a plurality of independently operable devices respectively with which they are associated for storing multiple place counts pertaining to the operation of those devices respectively, resetting means for individually angularly resetting each of the storage counters, transfer means for selectively transferring the multiple place counts of the storage counters to the register during the resetting of the storage counters respectively and in accordance with the angular resetting displacement thereof, first interlock means for preventing transfer from each storage counter during the operation of the associated device, and second interlock means for preventing operation of each of said devices during the transfer of a count from the associated storage counter to the register.

16. A counting and registering system comprising a storage counter having a plurality of rotatable storage elements of ascending order, storage counter drive means for driving the lowest order storage element in analog fashion, transfer means for indexing the remaining order storage elements, a register having a plurality of independently driven register wheels of ascending order corresponding to the storage elements of ascending order; positioning means for angularly displacing the register wheels in accordance with the angular displacement of the corresponding storage elements respectively including switches mounted for movement between withdrawn positions and extended positions in operative association with the storage wheels respectively, electrical motors for the register wheels electrically connected for energization by the switches respectively, and switch operating means on each storage wheel for actuating the respective switch when extended into operative association with the storage wheel; and count transfer means for extending the switches and for resetting the storage counter to zero.

17. A gasoline purchase registration system for use in gasoline stations having a plurality of gasoline pumps with visual counters adapted to be driven for registering the cost and/or volume of the gasoline dispensed with the pumps respectively, comprising a plurality of storage counters operatively connected for being driven with the visual counters of the gasoline pumps respectively, each of said storage counters having a plurality of rotatable storage elements of ascending place, a printer having a plurality of rotatable print wheels of ascending place corresponding to the rotatable storage elements of ascending place, resetting means for selectively resetting the storage counters of the gasoline pumps respectively by angular rotation of the rotatable storage elements to zero positions, and transfer means for transferring the place counts of the rotatable storage elements to the corresponding rotatable print wheels of the printer by angular displacement of the print wheels substantially equal to the angular displacements of the corresponding rotatable storage elements as they are reset to zero.

18. The gasoline purchase registration system of claim **17** wherein the transfer means comprises switches mounted for actuation by the rotatable storage elements respectively, switch operating means associated with each of the storage elements for actuating the respective switch a number of times proportional to the angular displacement of the storage element as it is reset to zero, and electrical indexing motors for independently indexing the print wheels respectively, said indexing motors being electrically connected for indexing the print wheels one count for each actuation of the switch of the corresponding storage element.

19. The gasoline purchase registration system of claim **17** wherein the lowest place storage elements of the storage counters are driven in analog fashion, wherein the storage counters comprise transfer means for indexing the remaining storage elements of the storage counters in digital fashion, and wherein the transfer means is adapted to index the print wheels in digital fashion.

20. A counting and registering system comprising a plurality of storage counters connected for independent counting operations, said storage counters each having a plurality of rotary storage elements of increasing order adapted to be indexed in a counting angular direction from initial angular positions for storing a count, a register having a plurality of independently rotatable register wheels of increasing order corresponding to the rotary storage elements of increasing order, said register wheels being adapted to be angularly indexed in a subtracting angular direction from initial angular positions for registering a count, selection and transfer means operable for selectively resetting the storage counters by angularly displacing the rotary storage elements of the selected storage counter in the counting angular direction to their initial angular positions and for individually transferring the count in each storage element to the corresponding register wheel by angularly indexing

the register wheels in the subtracting angular direction substantially equally to the resetting angular displacements of the corresponding rotatable storage elements, register reset means for resetting the register wheels to their initial angular positions, and means for preventing operation of the selection and transfer means to transfer a count from a storage counter to the register until after a count previously transferred to the register has been erased by resetting the register wheels to their initial angular positions with the register reset means.

21. The counting and registering system of claim 20 wherein the selection and transfer means provides for transferring the count of the selected storage counter to the register wheels in digital fashion and wherein the register is a printer with angularly spaced printing type on the register wheels.

22. A counting and registering system comprising a storage counter having a plurality of rotatable storage elements of increasing order, an electrical motor for indexing the storage counter in digital fashion, an electrical pulse generator for energizing the electrical motor, drive means for driving the pulse generator, an electrical reset motor for resetting the storage counter, a register having a plurality of independently rotatable register wheels of increasing order corresponding to the rotatable storage wheels of increasing order respectively, an electrical reset motor for the register, an electrical stepping motor for each of the register wheels, and count transfer means for transferring the count from the storage counter to the register as the storage counter is reset to zero including electrical pulse generating means for energizing each of the stepping motors a number of times which is proportional to the angular displacement of the corresponding storage counter element as the storage counter is reset to zero.

23. A counting and registering system comprising a storage counter having a plurality of rotatable storage elements of increasing order adapted for being indexed from initial angular positions for storing a multiple place count, storage counter drive means for driving the lowest order counter wheel in analog fashion, said storage counter having transfer means for indexing the remaining order counter wheels in digital fashion, storage counter reset means for resetting the storage counter elements to their initial angular positions, a register having a plurality of independently rotatable register wheels of increasing order corresponding to the rotatable storage elements of increasing order, and count transfer means for indexing the register wheels in digital fashion a number of times which is substantially proportional to the angular displacement of the corresponding storage counter elements as they are reset to their initial angular positions.

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