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[54] COIN TOTALIZING SYSTEM
2 Claims, 1 Drawing Fig.

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[56] References Cited

UNITED STATES PATENTS

2,521,350	9/1950	Dickinson	250/27
3,067,936	12/1962	Kasper	235/151
3,323,527	6/1967	Wu	133/8
3,365,045	1/1968	Guttmann	194/13
3,239,047	3/1966	Maxwell	194/9
2,671,171	3/1954	Rench	250/27

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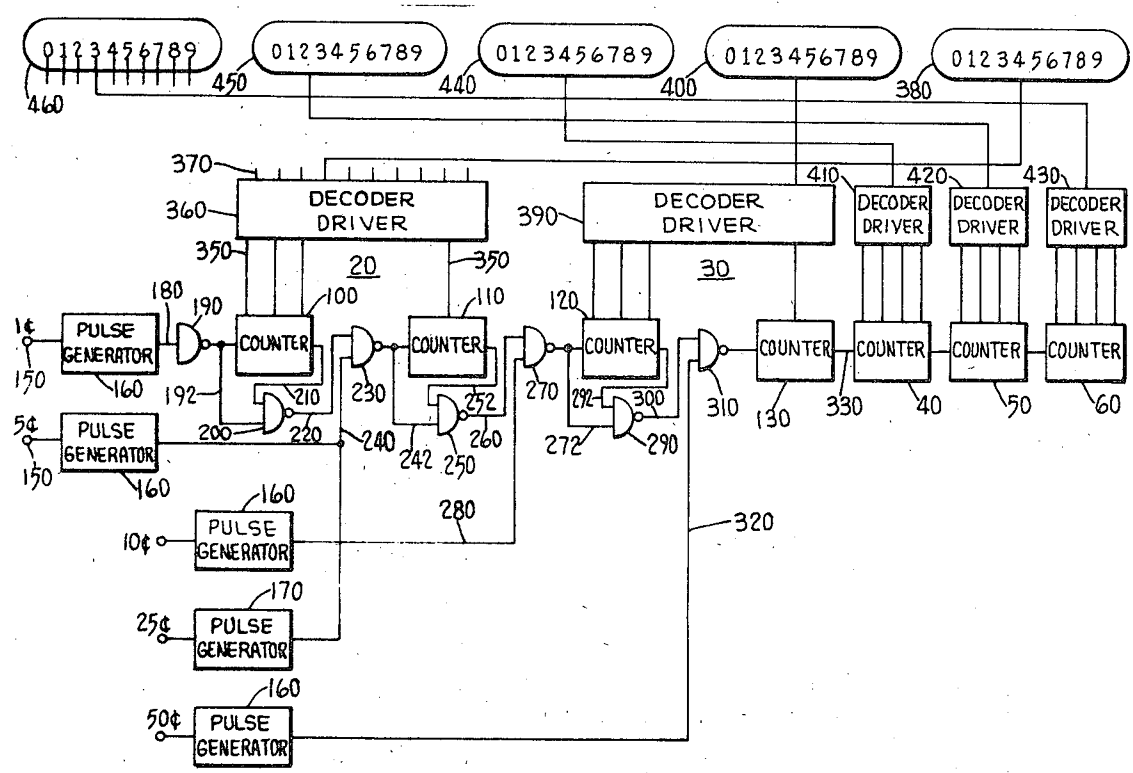
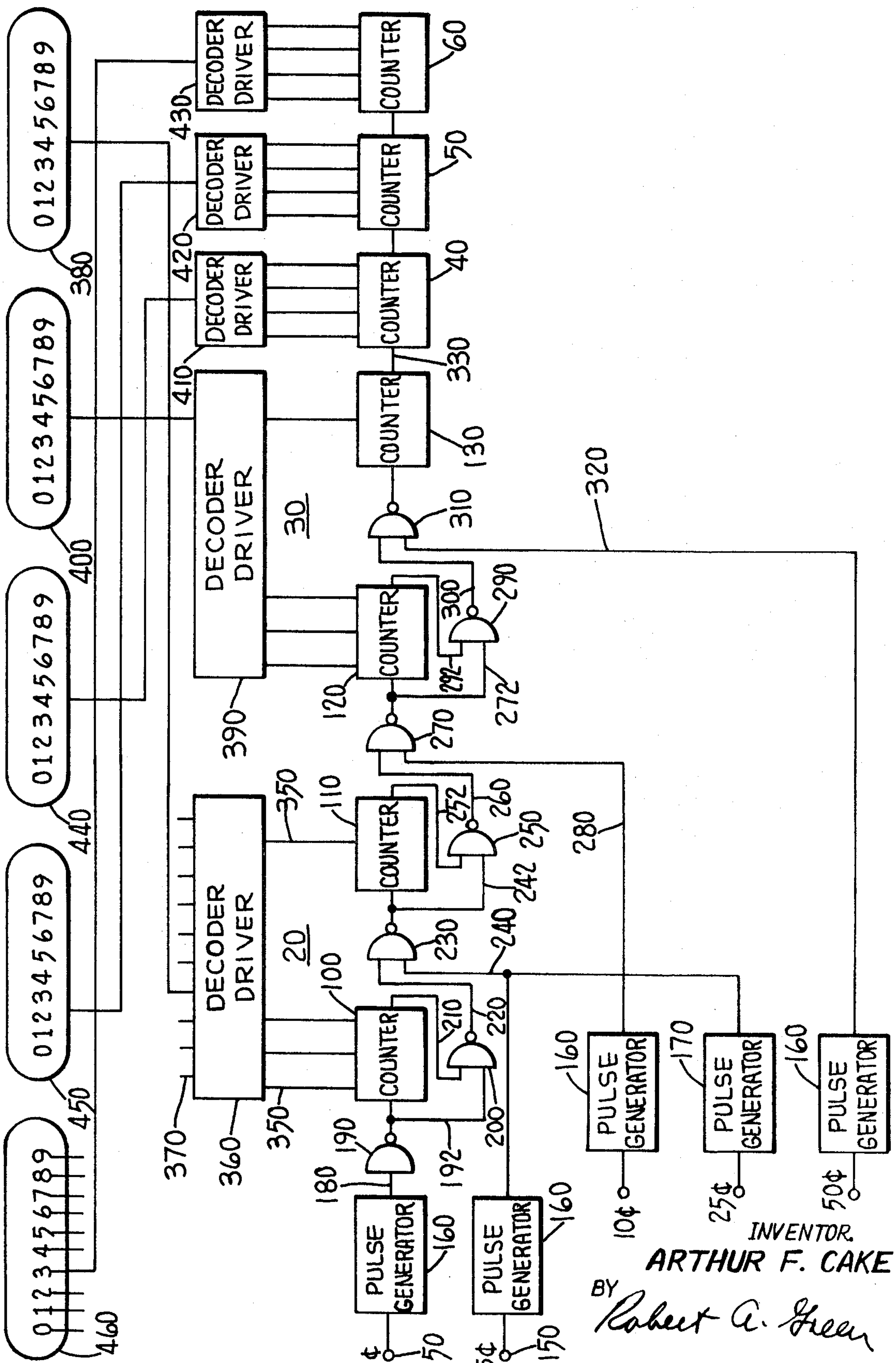
ABSTRACT: The system comprises a pair of binary counters set up to count up to 10 cents and a pair of binary counters set up to count up to 99 cents and a plurality of binary counters set up to count dollars, tens of dollars, hundreds of dollars, etc. Each pair of counters provides a binary-decimal output which is decoded and fed into a display device to provide a continuous total of money deposited.





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COIN TOTALIZING SYSTEM

BACKGROUND OF THE INVENTION

Coin counting equipment is known; however, the known equipment is rather complex and expensive, and, normally, does not provide a running total of coins deposited. The present invention is quite simple and inexpensive and provides a running total of coins deposited.

DESCRIPTION OF THE DRAWING

The single figure of the drawing is a schematic representation of a system and circuit embodying the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The coin totalizing apparatus of the invention 10 includes a first module 20 which is used to totalize pennies up to 10 cents, and a second module 30 which is used to totalize 10-cent units up to $1.00. The apparatus also includes counters 40, 50, 60 for totalizing units, tens, and hundreds of dollars. Higher orders may also be included, if desired. The first module 20 includes a divide-by-five counter 100 and a divide-by-two counter 110, and the module 30 also includes a divide-by-five counter 120 and a divide-by-two counter 130. Each of the dollar accumulating sections includes a divide-by-10 counter.

All of the counters may be flip-flop counters, as is well known in the art, and, as a practical matter, they may all be decade counters connected to provide one output pulse for a selected number of input pulses. A divide-by-five counter provides one output for each five inputs; a divide-by-two counter provides one output for each two inputs; and a divide-by-10 counter provides one output for each 10 inputs.

The counters 100 and 110 and the counters 120 and 130 are also connected to provide a binary-coded decimal output which can be decoded to provide a decimal representation of the total coin count at any instant. This is described further below.

The apparatus 10 includes a plurality of coin slots 150 for receiving pennies, nickels, dimes, quarters, and half-dollar pieces. Each slot, except the quarter slot, is coupled to an electronic module 160 for developing a pulse in response to each coin inserted. The slot for quarters is coupled to a pulse generator 170 adapted to develop five output pulses for each quarter deposited, and generator 170 is coupled to the nickels circuit. The circuit logic is set up to count five nickels, rather than a quarter unit.

The output of the 1 cent pulse generator is coupled by lead 180 to the input of a gate 190, the output of which is coupled into counter 100 and by lead 192 into a NAND gate 200. The output of counter 100 is also coupled by lead 210 into NAND gate 200. The fifth penny deposited provides pulses on lines 192 and 210 to operate NAND gate 200 to provide an output pulse. The output of NAND gate 200 is coupled by lead 220 into a NOR gate 230 positioned between the counter 100 and counter 110. The output of the pulse generator 160 associated with the nickel slot and the output of the pulse generator associated with the quarter slot are coupled together and by lead 240 into the input of the NOR gate 230. The output of the NOR gate 230 is coupled both into the counter 110 and by lead 242 into a NAND gate 250. The output of the counter 110 is also coupled by lead 252 into the NAND gate 250. The second of every two nickels deposited (totaling 10 cents) provides pulses on leads 242 and 252 to operate NAND gate 250. The output of the NAND gate 250 is coupled by lead 260 into an NOR gate 270 along with the output of the dime pulse generator by lead 280, and the output of the NOR gate 270 is coupled into the counter 120 of module 30. The output of the NOR gate 270 is also coupled by lead 272 into an associated NAND gate 290, along with the output of the counter 120 by lead 292. When a total of 50 cents has been received pulses appear on lines 272 and 292 to provide an output from gate 290. The output of the NAND gate 290 is coupled by lead 300 into a NOR gate 310 along with the output of the pulse generator coupled to the 50 cent slot by lead 320. The output of the NOR gate 310 is coupled to the input of the counter 130, and the output of the counter 130, operated on the receipt of a total of one dollar, is connected to the input of the units dollar counter 40 by lead 330. The units dollar counter 40 is connected to the tens dollar counter 50, and the tens counter 50 is connected to the hundreds counter 60, as illustrated.

The chain of counters is designed to use binary logic to count coins inserted and to decode the total to a decimal signal which is used in a decimal display device to provide a visual total count. The logic circuitry is as follows. Output leads 350 are taken from the flip-flops associated with the counters 100 and 110 in module 20 to provide 1–2–4–5 code output. These leads are connected into a combination decoder driver 360 which has 10 outputs 370, each of which is connected to a decimal display device, for example, one of the cathode numerals of an indicator tube 380 such as a type 6844–A NIXIE tube. Tube 380 displays cents. The counters 120 and 130 of module 30 are similarly connected to a decoder driver 390 which is connected to an indicator tube 400 which displays tens of cents.

The counters 40, 50, 60 are connected to provide an output in 8–4–2–1 code to decoder drivers 410,420, and 430, respectively, and to display tubes 440, 450, 460 for displaying units of dollars, tens of dollars, and hundreds of dollars, respectively.

It is to be noted that the decoder drivers normally have 10 outputs and the indicator tubes have 10 inputs to 10 numeral cathodes. However, to simplify the drawing, these are not all shown.

In operation of the system 10, initially, all of the counters and decoder drivers are set so that there is zero count in the counter and zero count displayed in the display tubes 380, 400, etc. With each cent inserted into its slot, a pulse is entered in counter 100, and the four outputs from the counters 100 and 110 are decoded by the decoder driver to apply a driving signal to the cathode numeral 1 in the cents indicator tube 380. Each cent inserted is thus entered in the system, and, when 5 individual cents have been inserted according to the logic of the system, an output pulse appears on line 210 along with a pulse on line 192, and a pulse is fed from NAND gate 200 on line 220 to NOR gate 230 into counter 110. Each individual nickel also feeds a pulse on line 240 into gate 230 and counter 110. The decoder drivers continually operate the display tubes to show the total of coins deposited.

After 10 cents have been inserted in any combination, pulses on line 242 and on line 252 from counter 110 are coupled to NAND gate 250, and a single output pulse is coupled on line 260 through NOR gate 270, and into counter 120 in module 30. Each dime inserted also feeds pulses through lead 280 into gate 270 and counter 120.

It can be seen that, if a nickel is inserted in a slot, it is entered directly through OR gate 230 into counter 110. This is the same as if 5 pennies had been inserted and the proper logic and indicator entry are made. Similarly, a dime inserted in its slot is entered through NOR gate 270 into counter 120. A quarter entered in its slot provides five pulses, each of which is equivalent to a nickel, and these pulses are entered through NOR gate 230 in counter 110. Similarly, a 50 cent piece entered in its slot is registered through NOR gate 310 in counter 130.

As coins are continually inserted, the operation continues, with the proper logic causing the indicator tubes 380 and 400 to enter a total up to and including 99 cents. The next penny or other coin inserted causes an output pulse from counter 130 to operate the first decade counter 40 and to turn on numeral 1 in the unit dollars indicator tube 450. Each subsequent dollar accumulated causes a count to be entered in counter 40 and in the tube 440. After $10.00 have been accumulated, an indication appears in tube 460, and, after $100.00

are accumulated, an indication appears in tube **460**, with all dollar and cent values in between being shown in the other tubes, as described.

I claim:

1. A coin totalizing system including

first and second binary logic counters, each having an input and an output and adapted to count from 0 to 9 cents,

third and fourth binary logic counters, each having an input and an output and adapted to count from 10 to 99 cents,

a first gate associated with said first counter,

a first linking gate between said first and second counters,

a second gate associated with said second counter,

a second linking gate between said second and third counters,

a third gate associated with said third counter,

a third linking gate between said third and fourth counters,

a first pulse generator associated with a pennies receiver and coupled to the input of said first counter and the input of said first gate,

a second pulse generator associated with a nickels receiver and coupled to the input of said first linking gate,

a third pulse generator associated with a dimes receiver and coupled to the input of said second linking gate,

a fourth pulse generator associated with a half-dollar receiver and coupled to the input of said third linking gate,

the output of said first counter being coupled to the input of said first gate whereby, when 5 pennies are received, input pulses are fed into the input of said first gate and a pulse is fed from the output of said first gate to the input of said first linking gate along with the output of said second pulse generator and to the input of said second counter,

the output of said first linking gate being coupled both to the input of said second counter and to the input of said second gate,

the output of said second counter also being coupled to the input of said second gate,

the output of said second gate being coupled to the input of said second linking gate along with the output of said second dimes pulse generator,

the output of said second linking gate being coupled both to the input of said third counter and to the input of said third gate,

the output of said third counter also being coupled to the input of said third gate,

the output of said third gate being coupled to the input of said third linking gate along with the output of said half-dollar pulse generator,

the output of said third linking gate being coupled to the input of said fourth counter,

the output of said fourth counter being coupled to auxiliary decade counters for counting units, tens, and hundreds of dollars,

all of said counters providing a binary-coded decimal output through decoders to display devices in which a continuous display of the deposited money is provided.

2. The system defined in claim 1 and including a fifth pulse generator coupled to a quarter receiver and adapted to generate five pulses for each quarter received, the output of said fifth pulse generator being coupled to the input of said first linking gate and thus to the input of said second counter.