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CURRENCY TESTING APPARATUS

Filed June 30, 1960

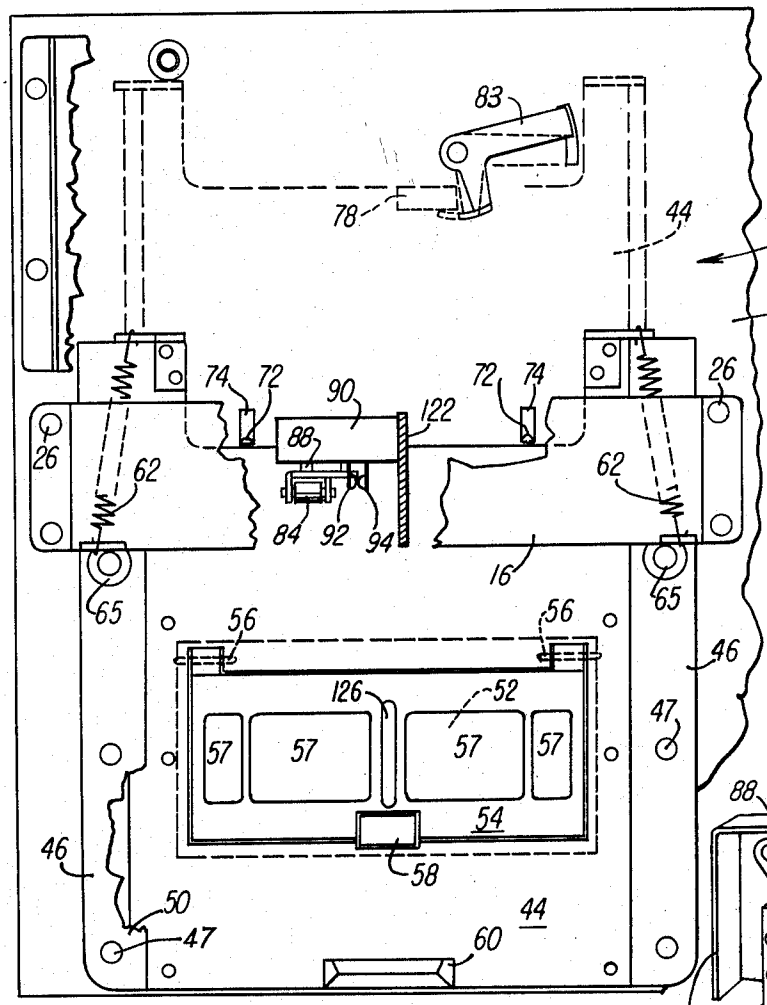


FIG. 1

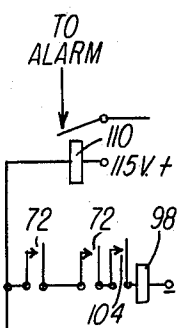


FIG. 3

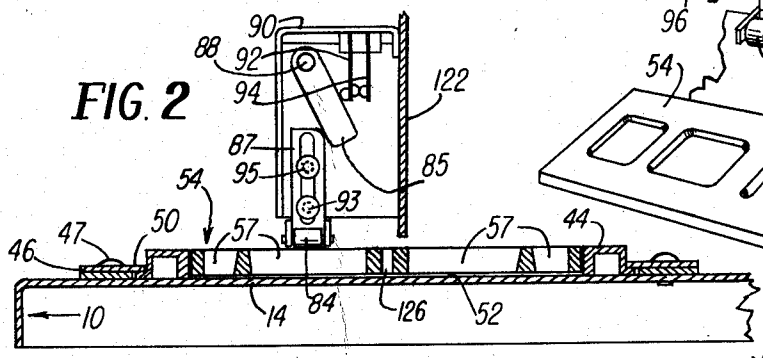
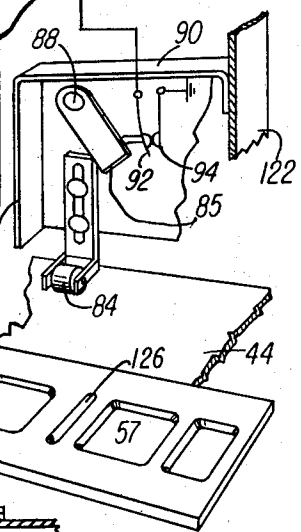


FIG. 2



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CURRENCY TESTING APPARATUS

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6 Claims. (Cl. 340—282)

This invention relates in general to currency test apparatus and more particularly relates to an arrangement for determining the condition of the currency retaining apparatus for maintaining a currency note properly positioned.

In its organization the present invention largely comprises novel structure for a currency acceptance unit and constitutes an improvement in the arrangement shown in application Ser. No. 744,966, filed on June 6, 1958, and now Patent No. 3,108,683. That application and its forerunners disclose the mechanical structure and the basic circuit arrangements permitting certain currency evaluations to be made. The arrangement by which this is done comprises a horizontal slide having a trough therein into which currency such as a dollar bill is deposited. A door hingedly secured to the slide is closed over the deposited currency and the slide carrying the currency is reciprocated into a test position between certain lamps and light responsive cells. On the slide being operated into the test position, appropriate circuitry is controlled to operate a solenoid, which locks the slide in place. The lamps are then lighted. The light is transmitted in various degrees through respective areas of the currency depending, of course, on the color and value of the respective areas. The light responsive cells underlying the various areas respond to the quantity of light passing through those areas to provide an indication of the acceptability of the currency. Thus these cells are divided into three groups called black, white and green in accordance with the well known characteristics of currency notes. The currency is rejected if either the black or green cells receive more than a predetermined amount of light or the white cells less than a predetermined amount of light. If found acceptable, the currency is collected into a cash box on being stripped from the slide. This is done by a stripper motor, solenoid and guillotine arrangement which operate as described in the mentioned application. A coin payout motor is also energized and it operates a cam or finger in any well known manner to dispense the required coins. The slide is released in the meantime and is automatically reciprocated into its unoperated position where it is prepared to receive another deposit of currency.

In the described apparatus the door is occasionally subject to mishandling and may be either torn from its moorings or otherwise distorted. The currency may therefore not be properly disposed within the trough and the apparatus may fail to fulfill its allotted task. In this circumstance it is desirable to prevent the apparatus from initiating the test sequence and to lock out the apparatus from further operation while providing an alarm.

It is therefore proposed in the present invention to insert a pair of normally closed contacts in the lock solenoid circuit, which contacts open, if the door is distorted or torn from its motorings to prevent initiation of the testing cycle. These contacts may also be used to operate an alarm circuit. It is further proposed to provide and combine therewith an arrangement operated responsive to the door being mishandled to prevent retraction of the slide from the test area.

It is therefore an object of the present invention to provide means for ascertaining a faulty condition of a currency test arrangement.

It is another object of the present invention to ascertain a faulty condition in a currency receptacle used for carrying a currency note into the test area of an automatic currency test arrangement.

It is another object of this invention to operate an alarm responsive to such a faulty condition and it is a further object of this invention to prevent retraction of the currency receptacle from the test area.

It is still another object of this invention to prevent a currency test arrangement from initiating a testing cycle responsive to a currency carrying receptacle being placed in a test area if said receptacle has a faulty condition.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawing, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure and/or circuits may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of this invention, there is illustrated in the accompanying drawing a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, this invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

FIG. 1 of the drawings is a top plan view of the structure including a slide, table top and attendant apparatus partially shown and similar to that shown in the aforementioned application;

FIG. 2 is a sectional view taken to illustrate the normal operative condition of the structure; and

FIG. 3 shows a largely schematic arrangement of the present invention in perspective together with various circuits with which the invention is concerned.

The drawings insofar as practical use the same reference characters as used in the aforementioned application to permit ease of identification of the various components and only so much of those components are shown as necessary to illustrate the operation of this invention.

Thus in FIG. 1 a horizontal table **10** is indicated in part and supported by means not shown. It carried a frame or bracket **16**, shown in part, on its top wall **14** secured thereto by means of screws **26**. The top wall of bracket **16** carries the lamps, not shown, which overlie the test area and it has suspended therefrom a pier **122** almost midway between the end walls of bracket **16**. A pair of runners or guide rails **46** are also appropriately secured at **47** to the top wall **14** of the table. Mounted between the runners **46** and extending beneath the offset portion **50** thereof is the slide **44**. It is provided with an opening **52** in an intermediate portion thereof into which the currency is inserted. The slide **44** also has a handle **60** thereon to permit its operation into the test area with the opening or trough **52** underlying the bracket or housing **16** as shown by the broken line in the FIG. 1 indicating the locked slide position.

The slide opening **52** is provided with a door **54** which is mounted on slide **44** at hinges **56** so that it may be operated by means of handle **58** to permit insertion of a currency note into the exposed trough **52**. The door is provided with aligned openings **57** whereby light may be transmitted through the note when properly related to bracket **16** and an opening **126** by means of which the note is stripped from opening **52**.

The slide **44** is normally urged away from its test position by means of partially shown coil springs **62** and anchored against bumpers **65**. Also shown are the bill feeler switches comprising member **72** protruding through respective openings **74**. They permit a determination to

be made that the currency is in the test area. Members 72 are closed to first operate a lock solenoid which initiates testing and locks the slide in the test position. The lock solenoid is provided with an armature which trips the latch element 83 to engage the abutment 78 carried by slide 44 as shown by the dotted lines in FIG. 1 to lock the slide in the test position.

Now it will be noted that the pier 122 supports a right angle bracket 90, which in turn carries a pair of contact springs 92 and 94 as may perhaps best be seen in FIGS. 2 and 3. Also carried on bracket 90 is a pivotally mounted feeler arm 85 supported on the bracket by pin 88. The arm 85 may, if desired, be biased for clockwise movement about pin 88 by a spring; however, gravity biasing alone is sufficient to secure its displacement to a vertical position if free. It will be noted that bracket 90 is provided so that the springs 92 and 94 and arm 85 may be supported with the least interference with the test operation and under most circumstances, they may be supported directly from pier 122.

Feeler arm 85 is normally biased from a vertical position by a slide door feeler arm 87 to hold springs 92 and 94 closed. Arm 87 is slidably mounted on bracket 90 by means of pins 93 and 95. It is thus permitted to move either up or down.

Arm 87 has a roller 84 at its lower end, which rides the slide 44 and the door 54 when the slide is reciprocated into the test area under bracket 16. If the height of slide 44 and door 54 vary, a suitable raised portion may be provided for either along the track of roller 84. The upper end of arm 87 and the lower end of arm 85 may each be provided with a rounded configuration to permit ease of movement of arm 85 so that springs 92 and 94 separate if the arm 85 is unduly pivoted.

In normal operation the slide door 54 is rotated about hinges 56 to open the same and a currency note is inserted in trough 52. Handle 60 is used to reciprocate the slide and note into the test area under bracket 16. The note, as explained in the forementioned application, operates bill feeler switch members 72. The slide operates a tray feeler switch 104 shown in FIG. 3 in any well known manner. That indicates the slide is properly positioned with regard to the test area. As shown in FIG. 3, this completes a circuit through springs 94 and 92 and switches controlled by members 72 through switch 104 to lock solenoid 98. Lock solenoid 98 operates its armature to trip the latch 83 which engages abutment 78 on slide 44 to lock the apparatus. The test cycle is now initiated and if the note is valid, it is collected and a coin payout is made.

If the door 54 should be missing or severely distorted when slide 44 is operated to the test position, arm 87 drops into trough 52. This permits arm 85 to pivot under the force of gravity into a vertcal or near vertical position dependent on the displacement of arm 87. Springs 92 and 94 open to prevent the completion of a circuit to solenoid 98 and initiation of the test cycle. Springs 92 and 94 on opening also control alarm relay 110 to provide an alarm. With arm 87 in trough 52, the arm 85 comes to rest in a vertical position in line with arm 87 to prevent arm 87 from being raised. This locks the slide and apparatus out of operation.

While the invention has been described with reference to the testing of paper currency, it will be understood that the concepts of this invention will have application to the testing of other sheet material advanced to a position for test whereupon the sheet material is either accepted and removed or else rejected and returned or otherwise disposed of. Such other sheet material may include cellulosic or plastic strips having printing or color designations thereon or therein such as tickets, checks, printed plastics, printed cards or other printed or colored sheet stock.

In accordance with the above, there has been shown and described herein a novel, useful and simple arrangement for determining a faulty condition in the currency receptacle of an automatic currency test arrangement, but the particular embodiments or forms of the invention described herein are not limitations upon other manners of practicing the invention.

I claim:

1. A currency testing apparatus comprising:
a slide,
an opening in said slide for receiving a note to be tested,
a cover for said opening having a closed position covering a note received by said slide for testing,
said slide mounted for reciprocable motion to traverse a path from a note receiving position to a note testing position,
said cover mounted to said slide for movement therewith,
detecting means located in the path of movement of said slide for engagement with the closed cover as it reaches the test position,
a control circuit for initiating the testing of said note,
and contacting means in said circuit governed by said detecting means,
said detecting means responsive to engagement with said closed cover to actuate said contacting means and close said initiating circuit,
said detecting means responsive to non-engagement by said cover to release said contacting means and open said circuit.

2. An apparatus as claimed in claim 1 including lock means responsive to the closure of said initiating circuit to lock the slide stationarily in said testing position.

3. An apparatus as claimed in claim 1 including switch means in said control circuit,
said switch means responsive to said slide reaching said test position for closing to complete the initiating circuit.

4. A currency testing apparatus comprising:
a slide,
an opening in said slide for receiving a note to be tested,
a cover pivotally mounted to said slide,
said cover pivotal to a closed position blocking access to a note received by said slide for testing,
said slide mounted for reciprocable motion to traverse a path from a note receiving position to a stationary note testing position,
detecting means located in the path of movement of said slide for engagement with the closed cover as the slide reaches the test position,
a control circuit for initiating the testing of said note,
and contacting means in said circuit governed by said detecting means,
said detecting means responsive to engagement with said closed cover to actuate said contacting means and close said initiating circuit,
said detecting means responsive to the absence of a cover in said closed position to release said contacting means and open said circuit.

5. A currency testing apparatus comprising:
a slide,
an opening in said slide for receiving a note to be tested,
a cover for said slide having a closed position blocking access to said slide opening,
said slide mounted to reciprocably traverse a path from a note receiving position to a note testing position,
said cover mounted to said slide for movement therewith to block access to said note during said traverse and to block access to the note with the slide in the test position,
detecting means located in said slide traverse path and positioned to be engaged by the closed cover as the slide reaches the test position,
said detecting means mounted for movement on said engagement from a first position to a second position,

a control circuit for initiating the testing of said note,
and contacting means in said circuit,
said contacting means responsive to movement of said detecting means to said second position for closing said initiating circuit.

6. A currency testing apparatus comprising:
a slide,
an opening in said slide for receiving a note to be tested,
a cover for said slide opening movable to a closed position isolating said opening,
said slide mounted to reciprocably traverse a path from the note receiving position to a stationary note testing position,
means mounting said cover for movement with said slide to block access to the note during movement of said slide,
detecting means located in the path of said slide traverse for engagement by the closed cover as the slide reaches the test position,
said detecting means mounted for movement on said engagement from a first position to a second position,
a control circuit for initiating the testing of said note,

and contacting means in said circuit governed by the movement of said detecting means,
said contacting means responsive to the movement of said detecting means to said second position for closing said initiating circuit,
and said contacting means responsive to said detecting means remaining in said first position for maintaining said initiating circuit in an open circuit condition thereby to signify a trouble condition.

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