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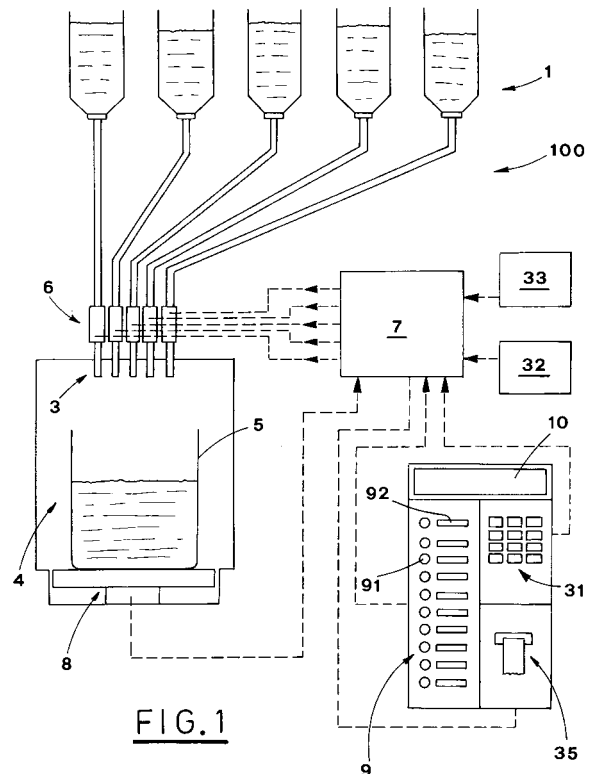
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(54) **Apparatus for dosing colored pigments and for mixing the pigments with a predetermined quantity of paint or enamel to be coloured**

(57) The apparatus for dosing colored pigments and for introduction thereof into a product to be colored, is aimed at allowing the direct use thereof by an unskilled user. The apparatus includes a plurality of tanks (1) containing colored pigments and connected to a corresponding number of delivery nozzles (3), which are situated in a coloring chamber (4). There is also a weighing machine 8, situated in the coloring chamber (4) and connected to a processing unit (7). A push-button panel (9) is connected to the processing unit (7), in order to allow to select the type of product to be colored. A numerical pad or alphanumeric keyboard (31) is likewise connected to the processing unit (7), in order to allow to select a color tonality. A display (10) is likewise connected to the processing unit (7) and is aimed at displaying data coming from the latter.



Description

[0001] The present invention relates to the technical field concerning the production of paints or enamels of a selected color.

[0002] In particular, the invention relates to an apparatus for coloring predetermined quantities of paints, enamels or similar products by using mixtures of colored pigments, in order to give to the above mentioned products a selected color.

[0003] The fact that paints, enamels or other similar products can be supplied in ranges of colors obtained during their production, is well known.

[0004] Usually, each color is indicated with a unique code, which identifies the kinds of pigments used for coloring and their proportions.

[0005] Otherwise, the products are supplied in neutral colors, for example white, and the colored pigments are supplied separately, according to a standard range of basic colors.

[0006] The final color of the product is obtained by adding one or more of the pigments to the neutral product in suitable proportions.

[0007] A selected color tonality is obtained by a perfect dosage of the pigments composing it.

[0008] Obviously, when a precise color tonality is to be obtained, the dosing cannot be performed manually, even if the kinds of pigments necessary to obtain the desired color are known.

[0009] Therefore, there are apparatuses, commonly known pigment metering devices, which precisely dose and mix the pigments of the right basic color, and are controlled by a suitably skilled operator.

[0010] The mixing is performed depending on the type and quantity of the neutral product to be colored, so as to obtain the desired color tonality.

[0011] Known metering devices usually include a plurality of tanks for as many pigments as different colors are required and each of the tanks has a control unit for controlling the pigments flow, connected to a processing unit.

[0012] Downstream of the flow control unit, there are a corresponding number of delivering nozzles, which open in a coloring chamber, housing a container with a neutral product to be colored.

[0013] The processing unit has a suitable program for dosing and controlling the above mentioned flow control units, and communicates with an operator by means of a monitor and a keyboard.

[0014] A spectrophotometer can also be connected to the processing unit for picking up the color tonality of a sample and send corresponding data to the processing unit.

[0015] The above described metering devices are installed not only in assisted shops selling coloring products, but also in many cash and carry wholesaler and self-service retail sale centers, even not exclusively for paint products sale.

[0016] In order to color a known quantity of product, the user must introduce the product container into the coloring chamber of the color metering device, after weighing it, in such a way that the container mouth (open) is situated under the delivering nozzles.

[0017] Then, the user must enter data into the processing unit through the monitor and keyboard in order to set the records concerning the product weight and type, and the code of the desired color to be obtained.

[0018] Otherwise, if there is the above mentioned spectrophotometer, the information about the desired color is entered into the processor by scanning with the spectrophotometer a sample of this color, after having suitably instructed the control program.

[0019] The color metering device features also, situated in the coloring chamber, a device, which prints a bar code on the container external part.

[0020] This code includes information used to define the coloring cost at the moment of the product payment.

[0021] The operator communicates with the processing unit by means of a graphic interface, specific for the program being executed, which can be more or less complicated, and its use can require a more or less in-depth skill for the operator.

[0022] In any case, it resulted that the presence of a skilled operator is necessary, not only in the assisted sale centers, but also in the large self-service centers.

[0023] Actually, it has been verified that the medium client's approach to the operations of coloring of the neutral product is usually difficult and it could cause setting errors which result in wrong product coloring.

[0024] This would result either in non-payment of the colored product, if the client notices his error in time, or in the subsequent returning of the product.

[0025] In any case, it is more probable that the client, after having seen the complicated input-output interface of the color metering device, gives up immediately and switches his attention to other products, or buys the products in other shops to avoid waste of time.

[0026] Another disadvantage derives from the fact that payment of the colored product could be delayed, mistaken, or facilitate illicit operations.

[0027] Actually, the product container has always at least one bar code already printed on its external surface.

[0028] The code printed by the color metering device is added to the above code/s and moreover, it is printed in a random position, as it depends on the orientation of the container in the coloring chamber.

[0029] When the buyer pays at the cash desk, it can be difficult for the cashier to find, identify and acquire not only the neutral code, but also the coloring one.

[0030] Moreover, after having known the color metering device printing system, a dishonest user could easily apply a film (for example, adhesive tape) to a container in the printing position and remove it after the printing.

[0031] In this way, the dishonest user could pay only for the neutral product, avoiding paying for the coloring.

[0032] The main object of the present invention is to propose an apparatus for coloring paints, enamels and similar products, which is easy and immediate to use also by unskilled users.

[0033] Another object of the present invention is to propose an apparatus, in which the possibility of data setting errors is reduced to minimum.

[0034] A further object of the present invention is to minimize the possibility of errors or frauds concerning the payment of the coloring operations.

[0035] The above mentioned objects are wholly obtained in accordance with the contents of the claims.

[0036] The characteristic features of the invention, as they will result from the claims, are pointed out in the following detailed description with reference to the drawings, in which:

- Figure 1 is a schematic view of the configuration, in its principal parts, of an apparatus for dosing colored pigments, and for mixing them to a prefixed quantity of a product to be colored (color metering device), obtained according to the present invention;
- Figure 2 is a schematic view of the above mentioned color metering device, equipped also with means for automating the payment for the coloring operations.

[0037] With reference to the above described figures, the color metering device, indicated as a whole with the reference numeral 100, includes a plurality of tanks 1, containing the above mentioned colored pigments.

[0038] Obviously, the tanks 1 are situated inside a containing structure, suitably paneled, which is not shown, as it is not relevant to the invention.

[0039] There is also a coloring chamber 4, opening outwards of the color metering device 100, aimed at housing containers 5 of the product to be colored.

[0040] The containers 5 are sold pre-packed in different shapes, and each of them contains a quantity of product with a predetermined weight.

[0041] The containers are supplied closed hermetically with a cover, which must be removed before the introduction into the coloring chamber 4.

[0042] The products to be colored can be of different type: for example washable, transpiring, peeled paints, enamels, anti-rust paints and all other products which can be subjected to coloring.

[0043] A plurality of delivery nozzles 3, each of which connected to a respective tank 1, are situated in the upper part of the coloring chamber 4.

[0044] Flow adjustment means 6 are situated between the tanks 1 and the corresponding delivery nozzles 3 for adjusting the flow of colored pigments leaving the tanks 1.

[0045] The flow adjustment means 6 are for example formed by high precision dosing pumps of known type

and commonly used in the traditional color metering devices.

[0046] The pumps 6 are operated by a processing unit 7, which is connected to the pumps by suitable and known interfaces and is aimed at running a program for creating prefixed colors, according to techniques for combination and dosing of two or more basic colors, from among the colors contained in the tanks 1 and in relation to the data previously entered into the unit.

[0047] Mass measuring means 8, situated inside the coloring chamber 4, below the delivery nozzles 3, are advantageously composed of a weighing machine, of the type equipped with a load cell, and are aimed at housing the container 5 with the product to be colored, in order to define its weight.

[0048] The weighing machine 8 is electrically connected to the processing unit 7 by a suitable and known interface, in order to send information about the weight of the product to be colored, to the processing unit 7.

[0049] First data input means 9 are situated in a position easily accessible from outside of the color metering device 100 and connected to the processing unit 7.

[0050] The first data input means 9 are operated by an user to enter information about selected type of product to be colored and introduced inside the coloring chamber.

[0051] The first data input means 9 substantially include a plurality of push buttons 91, each of which is connected to the processing unit 7 in such a way as to be unambiguously identified.

[0052] Beside the push buttons 91, there are corresponding labels 92 with the name of a type of product to be colored.

[0053] The same connection between each button 91 and the type of product is present in the coloring program in operation in the processing unit 7.

[0054] The color metering device 100 includes also second data input means 31, 32, 33, likewise connected to the processing unit 7 and operated by the same user to communicate to the latter the selected color tonality.

[0055] The second data input means 31, 32, 33 include substantially a keyboard 31, for entering an identifying code of the color chosen for the product coloring.

[0056] Usually, a numerical pad keyboard is enough, because the identifying codes are composed of sequences of numbers.

[0057] However, it is possible to provide alphanumeric keys in case it is advisable to use codes containing one or more letters.

[0058] The second data input means include also a spectrophotometer 32, which detects the color tonality from a sample and sends the information about it to the processing unit 7.

[0059] They include also a bar code scanner 33, which reads identifying codes of color samples from a set of samples, in which each tonality is coded with this technique.

[0060] The above mentioned keyboard 31, spectro-

photometer 32 and the bar code scanner 33 can be present in the color metering device 100, separately or integral in one body, according to the specific needs.

[0061] The color metering device 100 includes a display 10, which is situated near the data input means and connected to the processing unit 7, and which is aimed at displaying information issued by the processing unit 7.

[0062] The information usually consists of the repetition of codes entered by the user and of simple messages of confirmation or error in the operations execution.

[0063] The information can be also supplied by vocal messages, through a suitable acoustic transducer, in a known way.

[0064] An optional printing device 35 is operated by the processing unit 7 for printing information concerning the executed operations.

[0065] For example, the code of the obtained color can be printed, possibly on auto-adhesive paper, in order to allow the user to reproduce it in future.

[0066] The color metering device 100 includes also collecting means 41, 42, 43, connected to the processing unit 7 and aimed at collecting corresponding credit instruments 51, 52, 53 from the color metering device 100 user, in order to activate the coloring operations.

[0067] In particular, a token acceptor device 41 is provided for accepting tokens and/or coins 51 of suitable shape or value, until the cost of operation to be executed is reached.

[0068] The structure and working of the above mentioned token acceptor device will not be described in detail, since it is known and commercially accessible.

[0069] These devices are supplied with characteristics which enable their connection with electronics for driving their operation and receiving enabling signals therefrom.

[0070] The color metering device 100 includes also, together with or instead of the token acceptor 41, a paper currency validator 42, which identifies and accepts notes 52.

[0071] The validator 42, likewise of known type, is connected to the processing unit 7 according to validator proper interface characteristics, and is aimed at receiving, from the processing unit 7, information about the total cost of a coloring operation set by a user and at transmitting to the processing unit 7 information to execute the coloring operation after having collected notes 52 for a value sufficient to cover the total cost.

[0072] A change dispensing device 44 is optionally associated to the note acceptor 42 for dispensing coins, whose value corresponds to the difference between the sum collected by the notes validator 42 and the cost of the coloring operation.

[0073] Together with or instead of the previously mentioned token acceptor 41 and note validator 42, the color metering device 100 includes a credit card reader 43, aimed at crediting the cost of coloring operation charging it to the credit card 53 introduced by the user.

[0074] A board-supported alphanumeric display 60, situated near the collecting means 41, 42, 43, is connected to the processing unit 7 and is aimed at receiving from the latter and at visualizing instruction and information for the user of the color metering device 100.

[0075] Otherwise, in color metering device 100 equipped with an input-output terminal formed by a monitor and a corresponding keyboard, the instructions and information can be displayed on the monitor.

[0076] The display 60 can possibly coincide with the above mentioned display 10.

[0077] The above mentioned printer 35 can be also used for printing information concerning the coloring payment.

[0078] In particular, the printer is aimed at printing the receipts for the payments with the credit card 43.

[0079] Also in this case, there can be a separate printing unit 61, aimed exclusively at printing the above receipts or in case of an invoice request.

[0080] The use of the above described color metering device 100 is particularly simple due to the presence of the weighing machine 8 and the first data input means 9 and second data input means 31, 32, 33.

[0081] Actually, the user, who is going to obtain a particular color for a vessel of product with neutral color, must only place the product container, already opened, in the coloring chamber 4, on the weighing machine 8.

[0082] The latter weighs the container and transmits its weight to the processing unit 7.

[0083] It is simple for the processing unit 7 to define the exact weight of the product contained in the vessel, beginning from the gross weight of the vessel, because there are sizes of vessels containing prefixed quantities of product (for example, half kilo, one kilo, five kilos, etc.).

[0084] Thus, the user pushes the button 91 corresponding to the product present in the vessel and then he enters the code of the desired color by the keyboard 31, taking it from the sample set or from a previous vessel of colored product.

[0085] Otherwise, there can be used the spectrophotometer 32 (in case a sample of desired color is available) or a bar code scanner 33, for entering information about the color tonality.

[0086] At this point, the color metering device 100 can perform the coloring, according to known techniques, and then print the relative information by the printer 35.

[0087] Moreover, the color metering device 100 obtained according to the invention allows the user to pay directly the sum for the coloring operation of a neutral product, such as paint or enamel, thus paying immediately the costs connected to the coloring operation, and releasing the cashier from the verifying if the payment has been executed or not.

[0088] In this case, at the cash desk, only the cost of the neutral product pack is to be paid, independently from the fact that the buyer has colored it or not.

[0089] The advantages of the present invention are

evident. First of all, the color metering device setting operations are particularly simplified for an unskilled user.

[0090] Actually, it is necessary to execute only two simple steps, immediately comprehensible and rapid, to set completely the color metering device 100.

[0091] Another advantage results from the improvement of the unskilled user's approach to the machine.

[0092] In fact, because no monitor, keyboard and showy and complicated user interface are present, even an user, who is less skilled in the use of processors, is able to execute easily and safely the setting operations. Thus error possibilities are reduces to a minimum.

Claims

1. Apparatus for dosing colored pigments and for introduction thereof into a selected quantity of product to be colored, **characterized in that** in includes: a plurality of tanks (1) containing said colored pigments; a plurality of nozzles (3) delivering said colored pigments, situated in a coloring chamber (4), for housing containers (5) of a product to be colored; flow adjustment means (6), situated between said tanks (1) and said delivery nozzles (3), for adjusting the flow of said colored pigments going toward said delivery nozzles (3); a processing unit (7), connected with said flow adjustment means (6) for operating the latter selectively, so as to adjust the flow of said colored pigments toward said delivery nozzles (3) in relation to data, which has been previously input in the processing unit (7); mass measuring means (8), connected to said processing unit (7), for acquiring information about the mass of the product to be colored and at making it accessible to the processing unit (7); first data input means (9), connected to said processing unit (7) and operated by a user to communicate the selected type of product to be colored; second data input means (31, 32, 33), connected to said processing unit (7) and operated by the user to communicate the selected color tonality; display means (10, 60), connected to said processing unit (7) for displaying information coming therefrom.
2. Apparatus according to claim 1, **characterized in that** said mass measuring means (8) are situated inside said coloring chamber (4), below said delivery nozzles (3).
3. Apparatus according to claim 1, **characterized in that** said mass measuring means (8) include a weighing machine of the type equipped with a load cell.
4. Apparatus according to claim 1, **characterized in that** said first data input means (9) include a plurality of push buttons (91), each of which identifies a

different type of product to be colored, and for each of said push buttons (91) there is provided at least one label (92), carrying information about the type of product.

5. Apparatus according to claim 1, **characterized in that** said second data input means include a panel-supported keyboard (31), aimed at entering identifying codes of pre-selected colors.
6. Apparatus according to claim 1, **characterized in that** said second data input means include at least one spectrophotometer (32), which detects the color tonality from a sample.
7. Apparatus according to claim 1, **characterized in that** said second data input means include a bar code scanner (33), which reads identifying codes of color samples from a set of samples.
8. Apparatus according to claim 1, **characterized in that** it includes a printing device (35), operated by said processing unit (7) to print information about the executed operations.
9. Apparatus according to claim 1, **characterized in that** it includes also collecting means (41, 42, 43), connected to said processing unit (7) and aimed at collecting corresponding credit instruments from a user of said color metering device (100) before activating the execution of the operations of said neutral product coloring.
10. Apparatus according to claim 9, **characterized in that** said collecting means (41) include a token acceptor, which identifies and collects tokens or coins (51).
11. Apparatus according to claim 9, **characterized in that** said collecting means (42) include a note validator, which identifies and collects notes (52).
12. Apparatus according to claim 11, **characterized in that** it includes also a change dispensing device (44).
13. Apparatus according to claim 9, **characterized in that** said collecting means (43) include a credit card reader.
14. Apparatus according to claim 9, **characterized in that** it includes also a dedicated printer (61), connected to said processing unit (7) and aimed at printing information about the coloring payment.

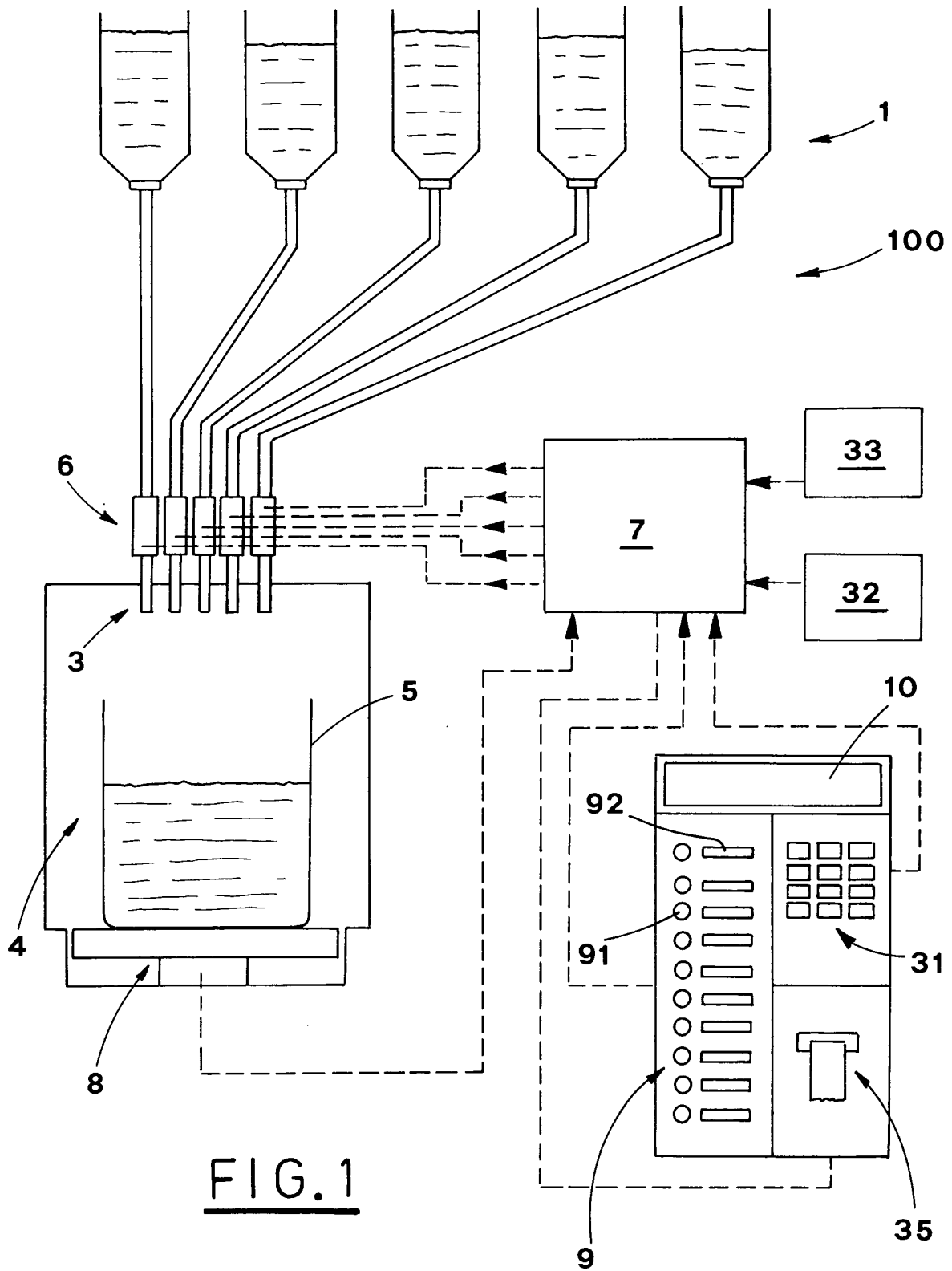


FIG. 1

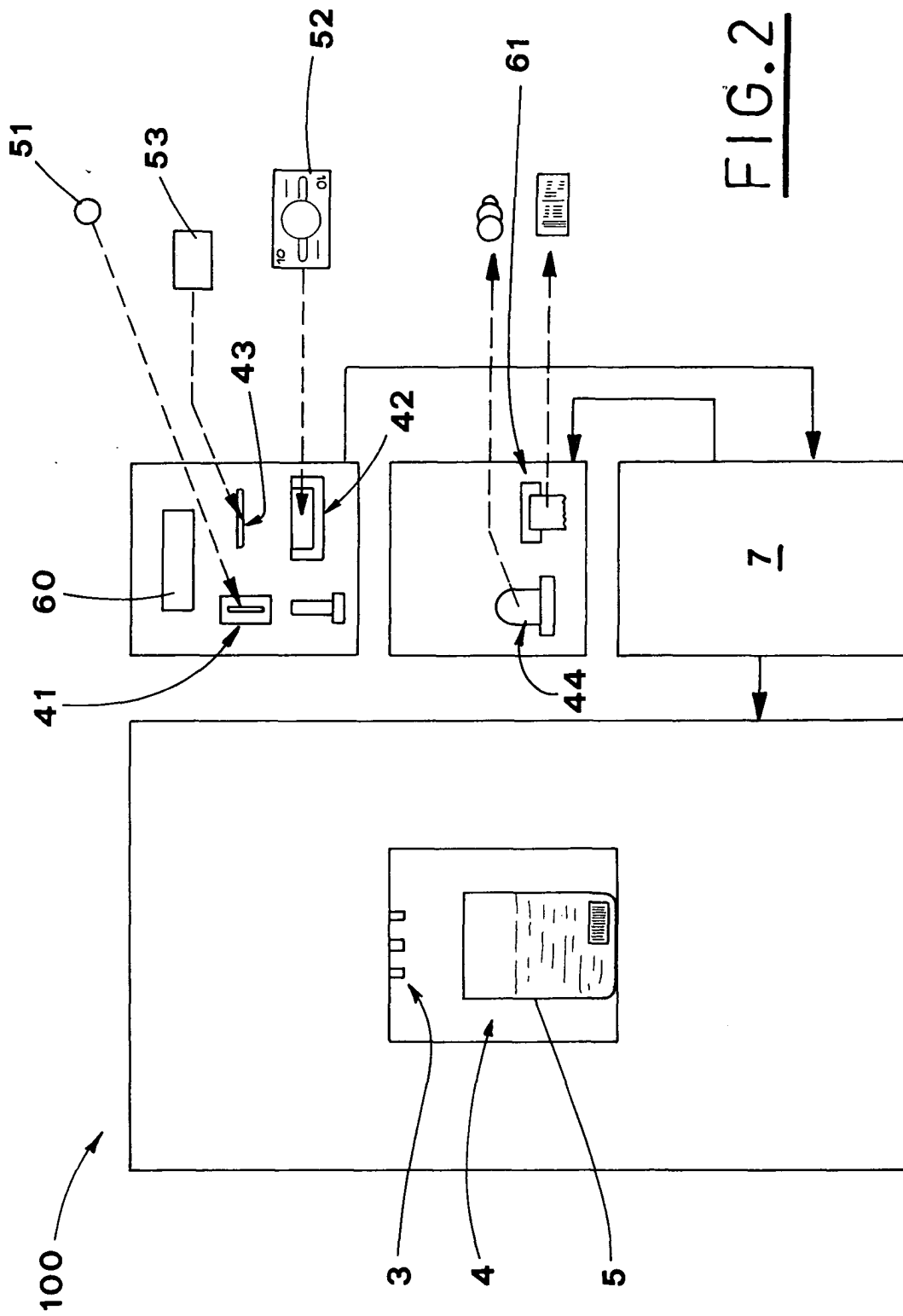


FIG. 2