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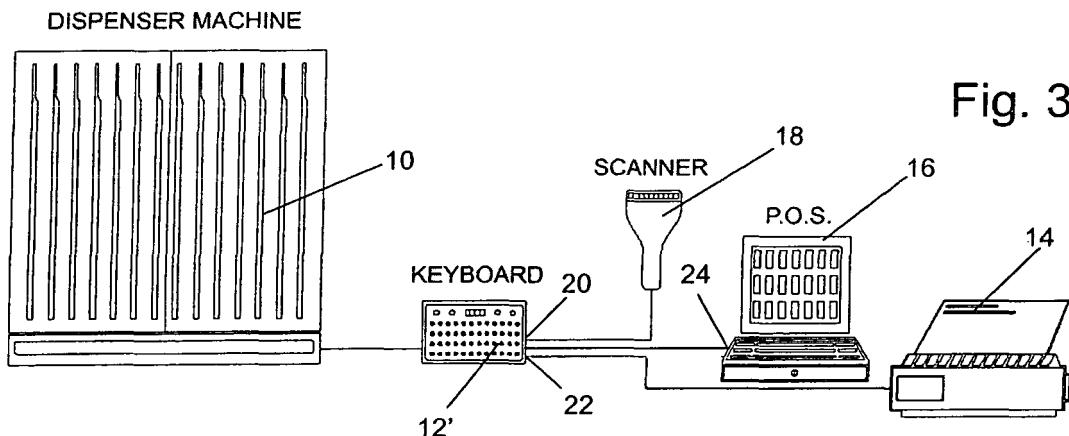
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(54) Product dispensing system

(57) A product dispensing system comprises a point of sale (POS) terminal 16, a barcode scanner 18, and a dispensing machine 10 for selectively dispensing individual product items of different product types in response to a dispense request identifying a particular product type. The dispense request may be generated by pressing a particular key on a keyboard 12' or by scanning a barcode label on a sheet of such labels. A data store

stores a plurality of product type IDs and a plurality of related barcode data each associated with a respective product type, and a controller automatically supplies to the POS terminal the barcode data relating to any product item successfully dispensed by the dispensing machine in response to a dispense request. For product items not dispensed from the dispensing machine, the controller supplies the POS terminal with the barcode data scanned by the barcode scanner.



Description

[0001] This invention relates to a product dispensing system.

[0002] In a prior art product dispensing system, Figure 1, a dispensing machine 10 containing product items of different product types is controlled by a remote keyboard-operated control unit 12, herein referred to simply as a keyboard unit. A user presses a respective key (or combination of keys) on the keyboard unit corresponding to a desired product type and the dispensing machine selectively dispenses an item of that product type. A common example of such a machine is a cigarette vending machine located behind a supermarket counter where, for example, each product type is a different brand of cigarette. In this case, where the packet includes a barcode, this can be scanned at a point of sale (POS) terminal to register the sale of the product item along with any other product items being purchased by a customer. The POS terminal is usually a personal-computer (PC) based terminal.

[0003] It will be appreciated that cigarettes are relatively high value items and it is important to ensure that the number of packets being dispensed is reconciled with the number sold, to prevent packets being dispensed without being paid for. In the system of Figure 1, the keyboard unit 12 includes a printer port 13 which is connected to a printer 14 to allow a journal to be printed. This however requires manual reconciliation with sales recorded by the POS terminal.

[0004] In one prior art solution to this problem, Figure 2, a modified POS terminal 16' is directly connected to the dispensing machine 10. However, for a dispensing machine manufacturer, this means that dedicated software must be produced for each POS terminal and for each version of till control software running on a POS terminal replicating the functionality of the keyboard 12 to ensure that each product dispensed will be registered as a sale.

[0005] According to the present invention there is provided a product dispensing system cooperable with a point of sale (POS) terminal having a barcode scanner for scanning barcodes on product items and providing respective barcode data in response to the scanning of each item, said dispensing system comprising a machine for selectively dispensing individual product items of different product types in response to a dispense request identifying a particular product type, a data store for storing a plurality of product type identifiers and a plurality of related barcode data each associated with a respective product type identifier, and a controller for automatically supplying to the POS terminal the barcode data relating to product items successfully dispensed by the dispensing machine in response to a dispense request, said controller supplying to the POS terminal the barcode data scanned by the barcode scanner for product items not dispensed from the dispensing machine

[0006] Embodiments of the invention will now be de-

scribed, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a conventional dispensing system;

Figure 2 shows another conventional dispensing system;

Figure 3 shows a first embodiment of a dispensing system according to the present invention;

Figure 4 shows a second embodiment of a dispensing system according to the present invention;

Figure 5 shows a multi-till embodiment of a dispensing system according to the present invention;

Figure 6 shows a second multi-till embodiment of a dispensing system according to the present invention; and

Figure 7 shows an interface circuit which can be used with the embodiments of Figures 3 to 6.

[0007] In a first embodiment of the invention, Figure 3, a modified keyboard unit 12' for controlling the dispensing machine 10 is provided with an adapter 20 for a barcode scanner 18 of a type normally used by a conventional POS terminal 16. This is typically a PS/2 or RS-232 type adapter, although the present invention is not limited to any particular type of adapter. The keyboard unit 12' in turn includes a port 22 for providing a connection to an adapter 24 on the POS terminal 16 into which a barcode scanner would be plugged in a conventional setup. The adapters 20 and 24 are preferably of the same type.

[0008] The keyboard unit 12' is initially programmed to associate different barcode data produced by the scanner 18 with respective different product types to be dispensed from the dispensing machine 10. This can be done either by uploading pre-programmed information to the unit 12', for example, through the adapter 20, or by training the unit 12'.

[0009] In the latter case, the keyboard unit 12' is set to program mode, for example, through a set of pre-defined keystrokes or by switching a hard switch. An item of each product type to be dispensed by the dispensing machine 10 is scanned in turn. The keyboard unit 12' receives the barcode data provided by the scanner 18 in respect of each such item and, upon pressing a corresponding keyboard unit key (or combination of keys), stores it in association with an identifier (ID) of the corresponding product type, preferably in non-volatile internal memory. Thus the keyboard unit memory contains a table associating each different product type with a respective different barcode and a respective different keyboard unit key or key combination, the latter being the key or key combination which is pressed in normal use of the system to dispense an item of that product type.

[0010] The keyboard unit 12' controls switching circuitry described in more detail later such that, in normal use, the scanner port 20 is connected directly to the port 22 of the POS terminal 16. Thus, as product items other than those dispensed from the dispensing machine 10 are scanned, the barcode data provided by the scanner 18 is fed directly to the POS terminal 16 in normal manner. However, when a key or key combination on the keyboard unit 12' is pressed which corresponds to a product type in the dispensing machine 10, the keyboard unit first provides a "dispense request" to the machine which instructs the dispensing machine to dispense an item of the corresponding product type. If successful, the keyboard unit 12' then automatically switches out the scanner 18 and supplies from its internal memory the barcode data corresponding to the product type dispensed to the POS terminal 16.

[0011] As will be described, in this embodiment, as well as in program mode, the keyboard unit 12' can be programmed to "listen" to barcode data scanned by scanner 18. In case an operator scans a product item dispensed from the dispensing machine 10, the keyboard unit 12' can either ignore this scan or warn the operator that a sale may be recorded twice.

[0012] Figure 7 shows an example of switching circuitry 70 contained within the keyboard unit 12' suitable for implementing various embodiments of the invention. The switching circuitry primarily comprises two sub-circuits: sub-circuit 70A for controlling PS/2-type connector POS terminals and scanners and sub-circuit 70B for controlling RS232-type connector POS terminals, scanners and printers.

[0013] For the embodiment of Figure 3, by comparison with conventional keyboard unit circuitry, the keyboard unit circuitry includes 4 additional control lines DL1...DL4 which are connected to the switching circuitry through jumper J7. Signals on the control lines DL1...DL4 control respective relays LS1...LS4. Figure 7 shows the positions of the relays when the signals on the control lines are OFF (the control signals are active low, so they are high when OFF and low when ON). A master relay LS5 controls a reference voltage VEE supplied to each of the relays LS1...LS4 and so enables such relays for switching under the control of DL1...DL4.

[0014] The keyboard unit control lines for the printer 14, previously connected to the port 13, are now connected to adapter J3, and the keyboard unit printer port 13 is now connected to jumper J5. When control line DL3 is set OFF by the keyboard unit 12' the changeover contacts of the relay LS3 are in their lower positions, as seen in Figure 7, so that the keyboard unit printer port 13, connected to jumper J5, is connected via relay LS3 to adapter J3. Thus, when a journal is required it can be printed as before, and this can be done independently of whether RS232 or PS/2 type scanner/POS terminal equipment is being used. However, in normal operation of the unit (i.e. other than when a journal is required to be printed) the control line DL3 is set ON, so that the changeover contacts

of the relay LS3 are normally in their upper positions.

[0015] Where the scanner and POS terminal have RS232-type connectors, the scanner 18 is connected to adapter J4 and the POS terminal 16 to adapter J6. Pin 1 of each adapter J3...J6 is TX, pin 2 RX and pin 3 is connected to ground.

[0016] Control line DL4 is normally OFF and connects scanner TX to POS terminal RX and to the keyboard printer port RX (scanner RX is permanently connected to POS terminal TX - so the scanner 18 is always "listening" to the POS terminal 16). As product items other than those from the dispensing machine 10 are scanned by the scanner 18, the POS terminal 16 picks up the signals from the scanner and can in turn control the scanner as required. In this state, the keyboard unit 12' can listen to scanner signals through the printer port at adapter J3. Thus, if it detects a scanner signal corresponding to a barcode stored in memory and associated with a dispensing machine product type, it can for example sound an audible alarm to indicate a product sale is being recorded twice (in this state, however, it cannot stop the scanner signal being provided to the POS terminal).

[0017] When a keyboard unit 12' key or key combination is pressed corresponding to a product item in the dispensing machine 10 and the corresponding product item is successfully dispensed, the control line DL4 is switched ON and connects the keyboard printer port TX to the POS terminal RX via the relay LS4, the scanner TX being temporarily open circuited. The keyboard unit 12' now retrieves from its internal memory the barcode data corresponding to the product type just dispensed by the machine 10 and sends such data to the POS terminal 16, so ensuring that the sale of the product item will be recorded without user intervention.

[0018] In the case of the scanner 18 and POS terminal 16 having PS/2 ports, a single adapter connected to jumper J2 is connected via a split lead to each of the scanner and POS terminal; in other words, the scanner and POS terminal are connected in parallel to jumper J2.

[0019] When the control lines DL1 and DL2 are OFF, as seen in Figure 7, the signal lines of scanner 18 are connected through relay LS1 to the opposite signal lines

of the POS terminal 16. Thus scanner Data_Out and CK_Out are connected respectively to POS terminal Data_IN1 and CK_IN1. As both scanner 18 and POS terminal 16 are connected in parallel to the same adapter, POS terminal Data_Out and CK_Out are likewise connected to Scanner Data_IN1 and CK_IN1 via relay LS1. This is the normal operating mode of the system, i.e. when non-dispensing machine product items are being scanned. When DL1 is on and DL2 is off, the scanner 18 is connected to the POS terminal 16 as before, but the keyboard unit 12' can now listen to the scanner output available at jumper J1 via relay LS2.

[0020] When a keyboard unit 12' key or key combination is pressed corresponding to a product item in the

dispensing machine 10 and the corresponding product item is successfully dispensed, the control lines DL1 and DL2 are switched ON. This disconnects the scanner 18 from the POS terminal 16 and connects the keyboard unit 12' to the POS terminal 16 via J1, LS2 and J2. As before, this allows the keyboard unit 12' to retrieve from its internal memory the barcode data corresponding to the product type just dispensed by the machine 10 and send such data to the POS terminal 16. Switching on DL1 and DL2 also connects the keyboard unit 12' both to listen to the scanner 18 and to talk to the POS terminal 16. This enables the keyboard unit 12' to temporarily store manually scanned barcode data before deciding whether or not to transmit it to the POS terminal 16. Thus, where a product item sale would otherwise be recorded twice, the keyboard unit 12' can decide not to forward a manually scanned barcode for a product item matching barcode data stored in its non-volatile internal memory.

[0021] As well as enabling the invention to be implemented in the RS232 case described above, the sub-circuit 70A of switching circuitry 70 also enables the invention to be implemented without a keyboard unit 12'. In a second embodiment of the invention, Figure 4, the control circuitry for implementing the invention is located within a modified dispensing machine 10' rather than in a keyboard unit. The control circuitry is connected to jumper J1 of the sub-circuit 70A and the POS terminal 16 and barcode scanner 18 are connected in parallel to the jumper J2, as previously described. The control circuitry in the modified dispensing machine 10' stores a table in its internal memory associating each different product type dispensed by the machine 10' with a respective different barcode.

[0022] Within the sub-circuit 70A, in this embodiment the control lines DL1 and DL2 are held ON. Thus, as described for the RS232 example of Figure 3, the control circuitry in the machine 10' is connected both to listen to the scanner 18 via LS1 and to talk to the POS terminal 16 via LS2.

[0023] In normal use, the control circuitry in the machine 10' listens at J1 for barcode data scanned by the scanner 18, and looks to see if any such barcode matches a barcode stored in the table in the machine's internal memory, i.e. matches a barcode corresponding to a product type to be dispensed by the machine 10'. Where there is no match, the received barcode data is forwarded to the POS terminal via J2 to record a sale. If there is a match, the dispensing machine control circuitry attempts to dispense a product item of the type associated with the barcode. If successful, the received barcode data is forwarded to the POS terminal 16 for recording as a sale. In this case, the keyboard unit is replaced with a sheet 26 bearing labels each identifying a different product type able to be dispensed by the machine 10' and including its associated barcode. When such a product is to be dispensed, therefore, an operator simply scans the barcode of the relevant label and the barcode data is sent to the machine 10' as a dispense request, the relevant

product item then being dispensed and the relevant barcode data being automatically provided to the POS terminal 16.

[0024] The invention can also be implemented in a multi-till environment. Referring now to Figure 5, a number of checkouts of the kind described with reference to Figure 3 are provided, except that they are connected to a common dispensing machine 10. Each checkout is provided with an individual identity and the dispensing machine 10 is arranged to communicate across a common bus 28 with the keyboard units 12'. When the dispensing machine successfully dispenses a product selected on a keyboard unit located at a particular checkout, it notifies the particular keyboard unit and the latter provides the appropriate signalling to its associated POS terminal to have the sale recorded.

[0025] Figure 6 shows another multi-till embodiment, this time comprising checkouts of the kind described with reference to Figure 4 but having a common dispensing machine 10'. Again, each checkout has an individual identity, and communication between the checkouts and the dispensing machine is via a common bus 30.

[0026] The invention is not limited to the embodiments described herein which may be modified or varied without departing from the scope of the invention.

Claims

30. 1. A product dispensing system cooperable with a point of sale (POS) terminal having a barcode scanner for scanning barcodes on product items and providing respective barcode data in response to the scanning of each item, said dispensing system comprising a machine for selectively dispensing individual product items of different product types in response to a dispense request identifying a particular product type, a data store for storing a plurality of product type identifiers and a plurality of related barcode data each associated with a respective product type identifier, and a controller for automatically supplying to the POS terminal the barcode data relating to product items successfully dispensed by the dispensing machine in response to a dispense request, said controller supplying to the POS terminal the barcode data scanned by the barcode scanner for product items not dispensed from the dispensing machine.
35. 2. A system as claimed in claim 1, wherein the controller normally connects the scanner to the POS terminal except when a dispense request is received in which case the scanner is disconnected from the POS terminal and the relevant barcode supplied to the POS terminal from the data store.
40. 3. A system as claimed in claim 1 or 2, wherein the dispense request is supplied by a keyboard having a respective key or key combination for each product
- 45.
- 50.
- 55.

type.

4. A system as claimed in claim 1, wherein the controller receives all barcode data provided by the scanner and, in the case of barcode data corresponding to a product item of a type not dispensed by the machine, provides such barcode data to the POS terminal, and in the case of a barcode data corresponding to a product item of a type dispensed by the machine, causes the machine to dispense such item and provides such barcode data to the POS terminal, the dispense request being constituted by the latter barcode data received by the controller. 5
5. A system as claimed in claim 4, wherein the dispense request is generated by scanning a barcode not carried by a product item of the type concerned. 15

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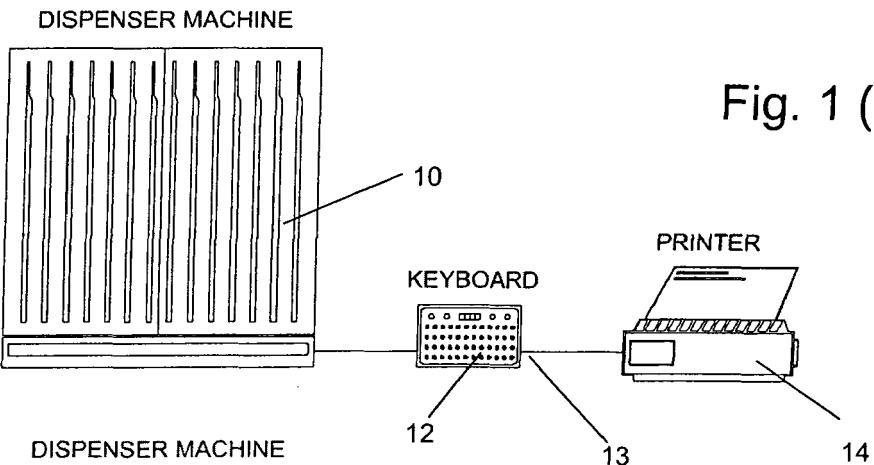


Fig. 1 (Prior Art)

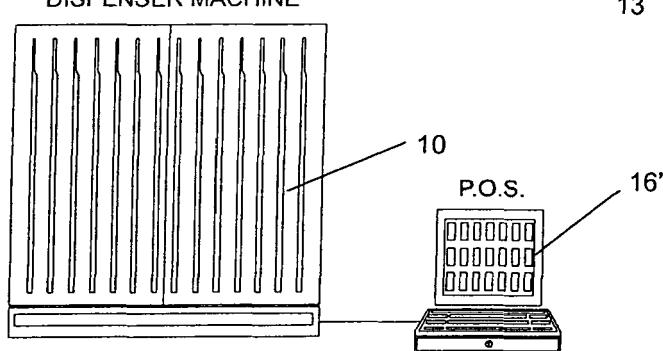


Fig. 2 (Prior Art)

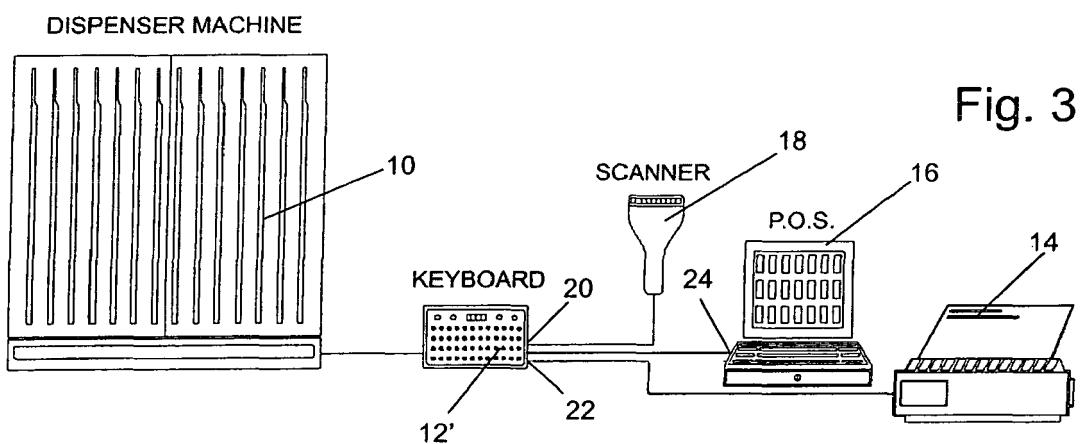


Fig. 3

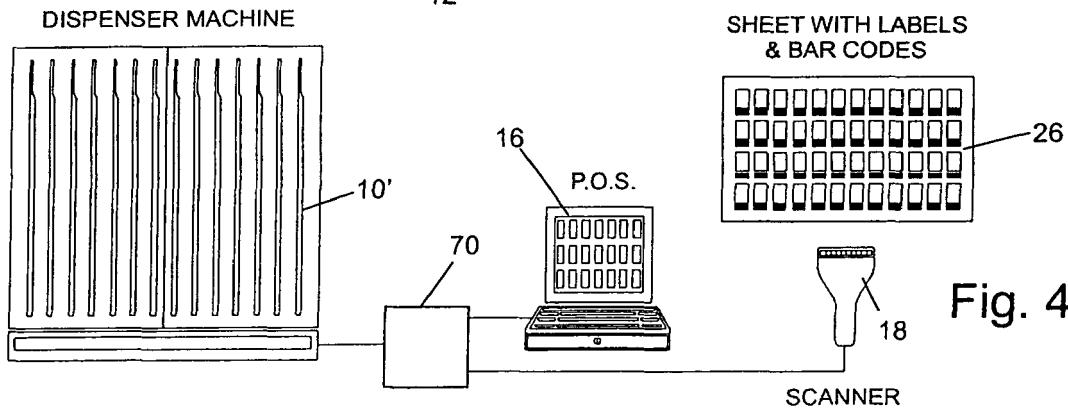
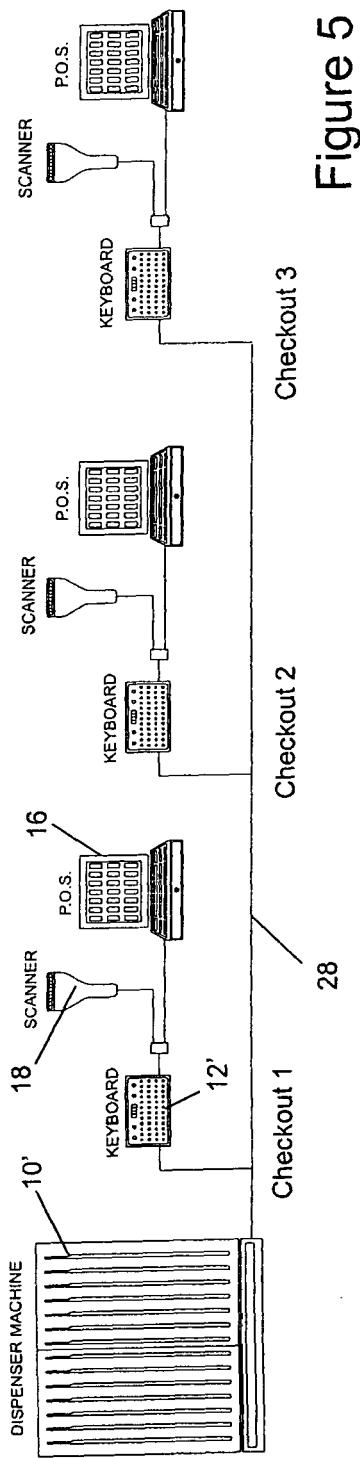
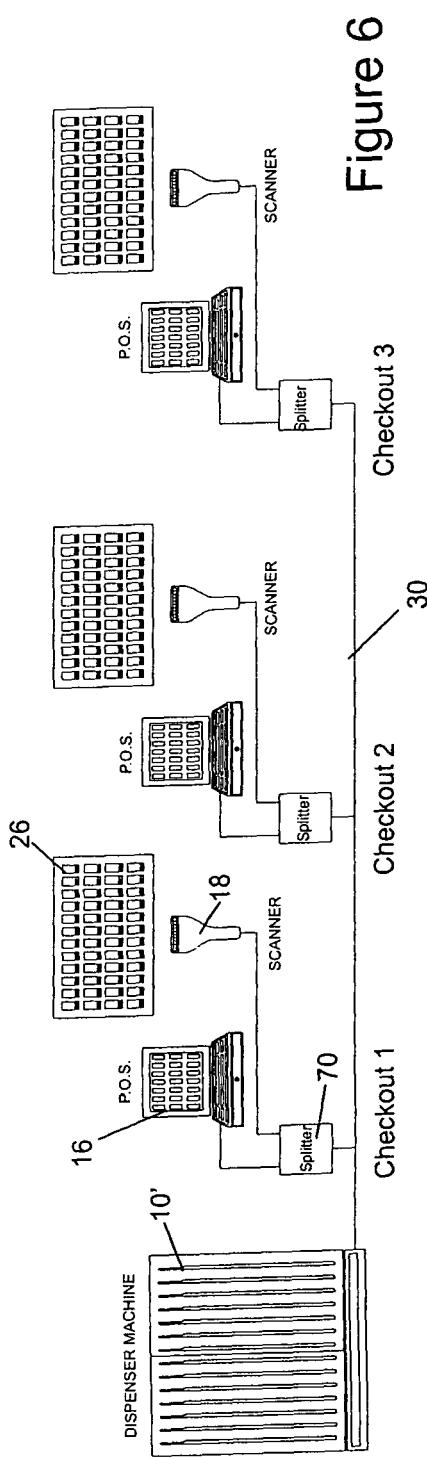


Fig. 4



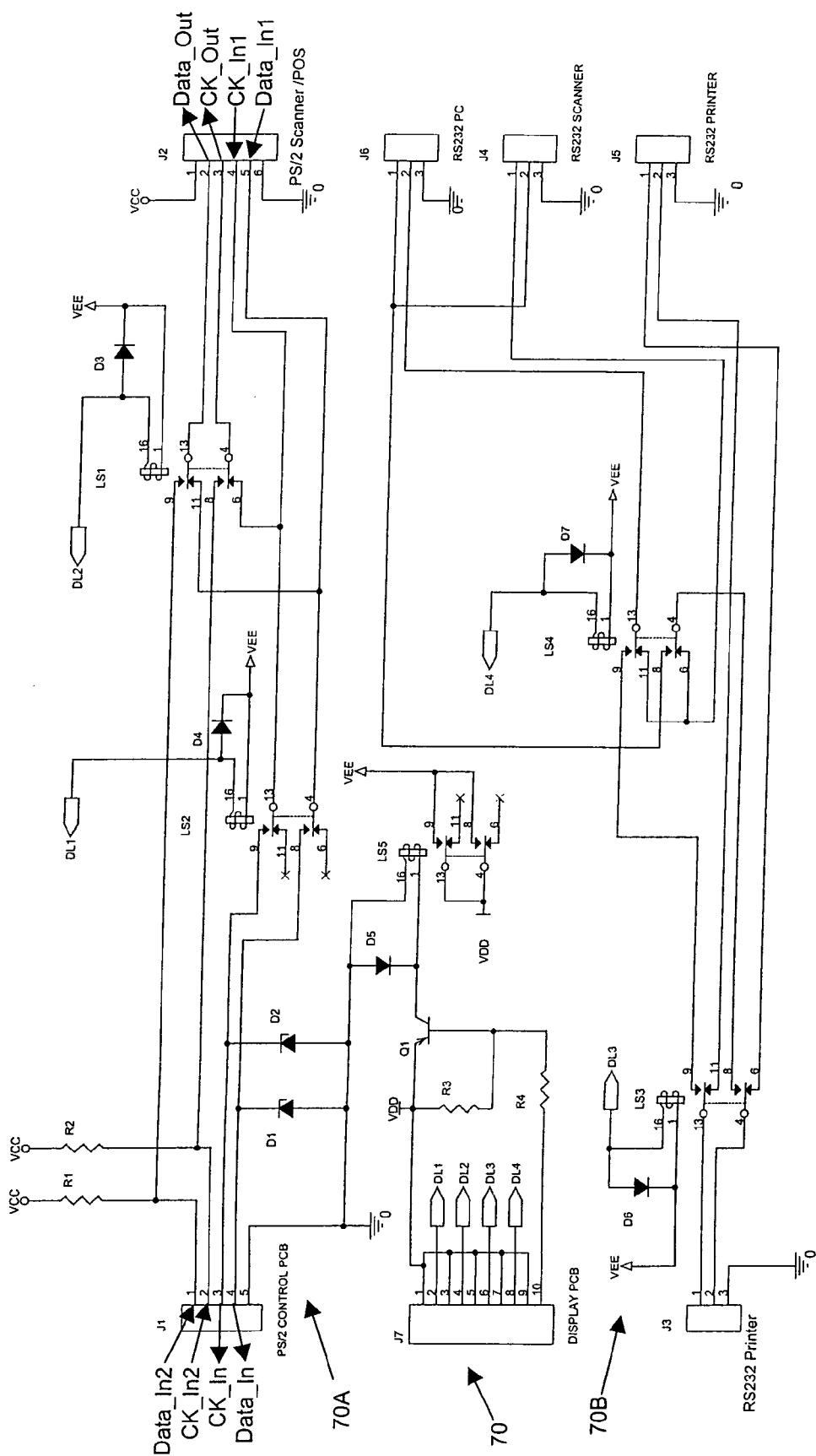


Figure 7



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 2003/222092 A1 (SHERROD GEORGE L) 4 December 2003 (2003-12-04) * paragraph [0008] - paragraph [0010] * * paragraph [0023] * * paragraph [0027] - paragraph [0028] * * paragraph [0032] * * paragraph [0041] - paragraph [0043] * * paragraph [0047] * * paragraph [0051] - paragraph [0052] * * paragraph [0054] * * paragraph [0061] *	1-5	G07G1/00
A	DE 44 21 067 C1 (SCHMID, NORBERT, 77776 BAD RIPPOLDSAU-SCHAPBACH, DE) 31 August 1995 (1995-08-31) * column 1, line 65 - column 2, line 27 * * column 3, line 65 - column 4, line 47 * * figure 1 *	1-5	
A	EP 0 670 132 A (VANDERDONCKT, PAUL EDMOND ANDRE JULIEN) 6 September 1995 (1995-09-06) * abstract * * column 2, line 17 - line 29 * * column 3, line 2 - column 4, line 34 * * column 5, line 54 - column 6, line 13 *	1-5	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G07G G07F
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2 The present search report has been drawn up for all claims			
Place of search Date of completion of the search Examiner			
Munich		13 July 2005	Königer, A
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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