Integrated Cash Management System CM21

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The demand for stricter cash management in sales offices and the decentralization of receipt and disbursement operations has been increasing in recent years in order to raise the operational efficiency of financial institutions. This paper will introduce such demands made by financial institutions, as well as a networked integrated cash management system, "CM21", a type of system that is not available from any other manufacturer.

Outline of CM21

CM21 is a terminal that manages cash receipts and disbursements for cash processing operations in the back office of sales offices. This new integrated cash management system terminal offers not only conventional stand alone-type open receipt and disbursement functions but it is also capable of network link ups with the host, sales office terminals and ATMs via a LAN connection to the backbone network (**Photo 1**).

Photo 1 CM21 Model 251[1)]

By linking with individual terminal systems on the network it is possible to strictly manage the exchange of funds between equipment as well as the data of detailed audits without involving human intervention, while centralizing the management of the funds on hand in sales offices, simplifying the database entry of financial forecasts. An image of the connections between individual terminal systems and the network are shown in **Fig. 1**.

Broad model lineup accommodates user needs

Devices for processing various types of cash are

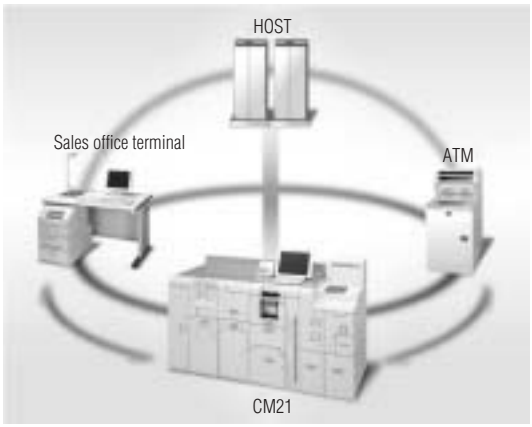

Fig. 1 Network connection configuration diagram[1)]

provided in component units with CM21, so that it is possible to respond to the needs of a wide range of users, from large-scale operations, such as city banks, to medium-scale operations, such as regional banks and small-scale operations, including cooperative banks, credit unions and agricultural cooperatives. This makes it possible to provide a liberal selection of cash types to be handled or to easily increase the capacity of the handled cash. The number of operating sections for controlling these units for processing cash can also be selected from one or two units, thereby making it possible to respond to the needs of users who deal with a small number of transactions as well as users who deal with a large number of transactions (**Fig. 2**).

Furthermore, consideration has been given to the design so that model modifications can be performed on site in order to respond to the changing environment of users following the implementation of CM21.

A configuration with a full complement of units is shown as an example in **Fig. 3**. This model with the name of CM21 Model 351 is marketed to large-scale operations with a high volume of cash processing.

Main features of CM21

CM21 offers features described under ① to ⑥ below, which are not available with conventional systems. Through these features it became possible to raise efficiency and implement stricter cash management for cash processing operations in the back offices of sales departments that had in the past been processed by individual cash processing terminals (deposit units, sealing units, etc.) of stand alone-type systems.

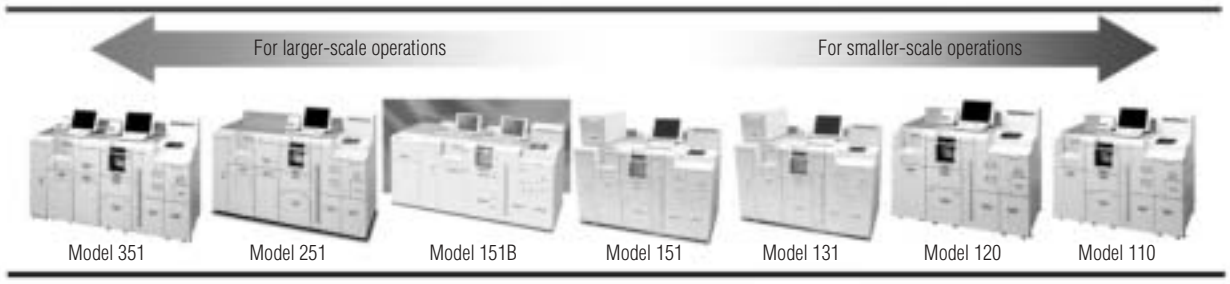

Fig. 2 CM21 model lineup (representative examples)

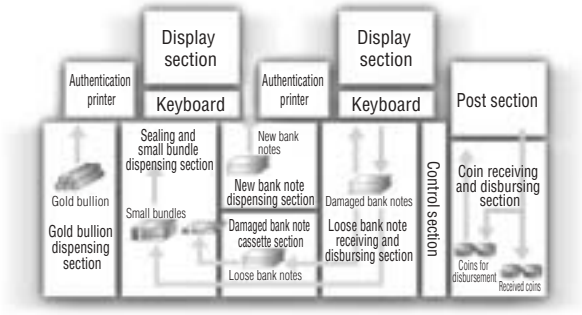

Fig. 3 Configuration of units[1)]

Fig. 4 Linking of cassettes[1)]

① ATM cassette linking function (for stricter cash management)
② Automated sealing function and twist feeding mechanism (for faster speeds)
③ Adoption of LAN and unit control method (for faster speeds)
④ Detailed auditing methods for small bundles and gold bullion (for faster speeds)
⑤ Adoption of large-size LCD and fault recovery navigation (for improved usability)
⑥ Flat usable space on top surface (for improved usability)

[Details of items ① to ⑥]

① ATM cassette linking function (for stricter cash management)

Cassettes for replenishing and collecting funds, as well as their interface are shared with CM21 as a means to facilitate the transfer of funds between ATM and CM21 units without human intervention. By preventing human error stricter cash management became possible (**Fig. 4**).

② Automated sealing function and twist feeding mechanism (for faster speeds)

CM21 features a "Small Bundle Recycling Function" that automatically binds deposited bank notes into small bundles and routes them for disbursement purposes.

A high feeding rate of 12 sheets per second for the transfer of bank notes between units was achieved through the development of a feeding mechanism for bank notes used in combination with this function (**Fig. 5**).

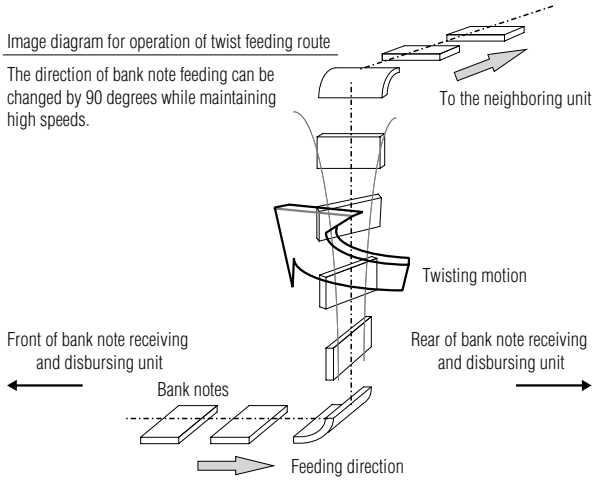

Fig. 5 Image diagram of twist feeding

③ Adoption of LAN and unit control method (for faster speeds)

The 100BASE-TX protocol*1) for LAN communications is used as the communication protocol for the network connection of CM21 with other external terminals on the network, as well as for the connection of individual units involved in cash processing within the equipment.

*1) 100BASE-TX is one of the Fast Ethernet standards. The communication speed is 100Mbit per second, with a maximum transmission range of 100m.

This enables high-speed communications with data between CM21 and other external terminals, as well as units inside the equipment itself.

As for data communications within the equipment, communications are conducted so that the control section can initiate execution of the respective functional operations, such as receiving and disbursing funds by individual units. A control mode that has been adopted involves a section to control only the unit that is the source of bank notes to be fed, while this bank note feeding source unit in turn controls other units to which bank notes are fed for the feeding operations, such as sorting and sealing, as well as automated sealing (**Fig. 6**).

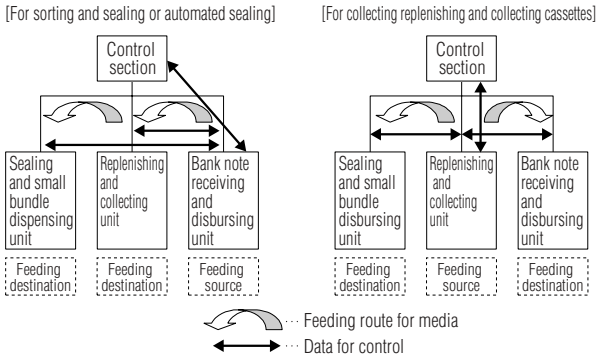

Fig. 6 Equipment internal control mode

This makes it possible to raise the feeding speed of bank notes to a constant level without impacting the load on the processing capacity of the control section.

Furthermore, since there is no need for the control unit to communicate with the individual destination of feeds, even when multiple units are in operation, the load on the communication process at the control section itself has also been reduced.

④ Detailed auditing methods for small bundles and gold bullion (for faster speeds)

The detailed auditing of small bundles and gold bullion uses an optical sensor method to calculate the number of small bundles and gold bullion. This makes it possible to perform detailed auditing without actually transporting media, resulting in the shortening of the auditing time.

Ordinary operations require operators to manually load bundles and gold bullion. Since detailed auditing can be performed immediately after such operations without interfering with other operations and in a short time, the early detection of errors arising from manual work done by operators becomes possible if detailed auditing is performed immediately following every such manual operation carried out.

⑤ Adoption of large-size LCD and fault recovery navigation (for improved usability)

Since CM21 is designated as an open receiving as well as disbursing unit and to ensure that anyone can operate it, including bank personnel at sales offices, etc., a 15-inch color liquid crystal display (with touch panel), which is a large LCD, has been adopted for CM21 to offer an operation display section that is more visible and easier to use.

Furthermore, the equipment is also the first of our mechatronics products to incorporate fault recovery navigation using a photographic screen. This navigation function facilitates easy fault recovery when a bank note jam occurs in CM21. The photographic screen displays the location at which a bank note jam has occurred and shows the fault recovery method to the operator in a clear manner so that it is possible for anyone to perform the recovery process of CM21 in a smooth manner (**Fig. 7**).

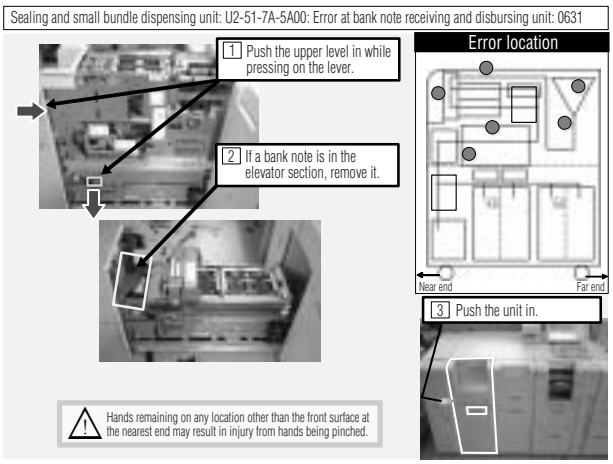

Fig. 7 Fault recovery navigation screen

The control section monitors the status of the feeding route sensors and unit engagement/disengagement sensors relevant to the location at which the cash processing unit notifies that a bank note jam has occurred, to acquire the transition status of the bank note jam in order to provide screen displays necessary for performing a fault recovery.

To offer guidance so that anyone can perform fault recovery the control section displays one by one in an appropriate manner, screens depicting the scenes of locations at which operations are needed, based on the information obtained from the cash processing unit (**Fig. 8**).

⑥ Flat usable space on top surface (for improved usability)

The top surface of the equipment has been made flat to allow it to be used as a working space so that tasks,

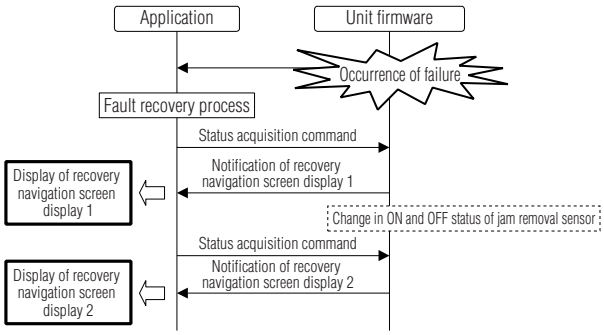

Fig. 8 Fault recovery navigation sequence

such as ledger entries and aligning bank notes, can be conducted on the equipment, as well as for using the space as a location for storing small items, such as accounting forms (**Photo 1**).

Impact of implementing CM21

By implementing CM21 it is possible to decentralize cash receiving and disbursing operations that are concentrated to particular persons in charge of receiving and disbursing, thereby eliminating the necessity of appointing individuals to be dedicated receipt and disbursement personnel.

Furthermore, since tellers can also easily operate the receiving and disbursing units, there is no longer any need to wait for the completion of the cash processing performed by a person in charge of receiving and disbursing, thereby reducing the waiting time for customers at teller windows. A financial institution that implemented CM21 is now able to complete their major disbursement process in approximately five minutes when it used to take approximately 15 minutes in the past, thereby reducing the time by about ten minutes.

Furthermore, through the incorporation of the system on LAN, it has become possible to gain access to terminals at sales offices via the backbone network, thereby reducing entry errors that occur when cash funds are received or disbursed. Since funds can be transferred through sharing the replenishing and collecting cassettes in common as well as interface with ATMs, without human intervention, it is possible to enhance strict cash management.

Future developments

Since the start of sales in FY2002 CM21 has a shipping and operation result that exceeds 1,000 units, which includes OEM sales, as of the end of FY2005.

The introduction of low-cost teller models will be promoted in the future to aim for further expansion of the market for our receiving and disbursing units. We anticipate making sales for the replacement of aging receiving and disbursing units that have been available for ten or more years and get out of the stagnant condition in the receiving and disbursing unit market, which has been lingering since immediately following the issuance of the new series of bank notes in FY2004.

References

1) Oki Electric web site: Product Introduction: Cash processing system

http://www.oki.com/jp/FSC/CASH/CM21.html

http://www.oki.com/jp/FSC/CASH/CM21b.html

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