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GB A 2057169**

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**B6C
B6F
G1W
H4T**

(54) **A postage metering system with display**

(57) A postage value determining scale or franking machine includes a scale for determining the weight of an item to be mailed, a system processor for determining the applicable postage value and a display for displaying a breakdown of such postage value, all inter-connected by a common data bus. Another embodiment of the disclosed invention further includes a keyboard having a keyset limited to numeric keys and function keys for entering additional information such as class of service, destination, etc. into the system processor to be used by the system processor in determining the applicable postage value; the system processor transmitting such information to the display. Preferably, the display includes a display processor, a display device operatively connected to the display processor for displaying alphanumeric information and a memory operatively connected to the display processor. The memory stores data defining display routines and formats and alphanumeric data codes corresponding to the various components of the postage values. The display processor uses these codes to display the components of the determined postage value in a predetermined format in alphanumeric form.

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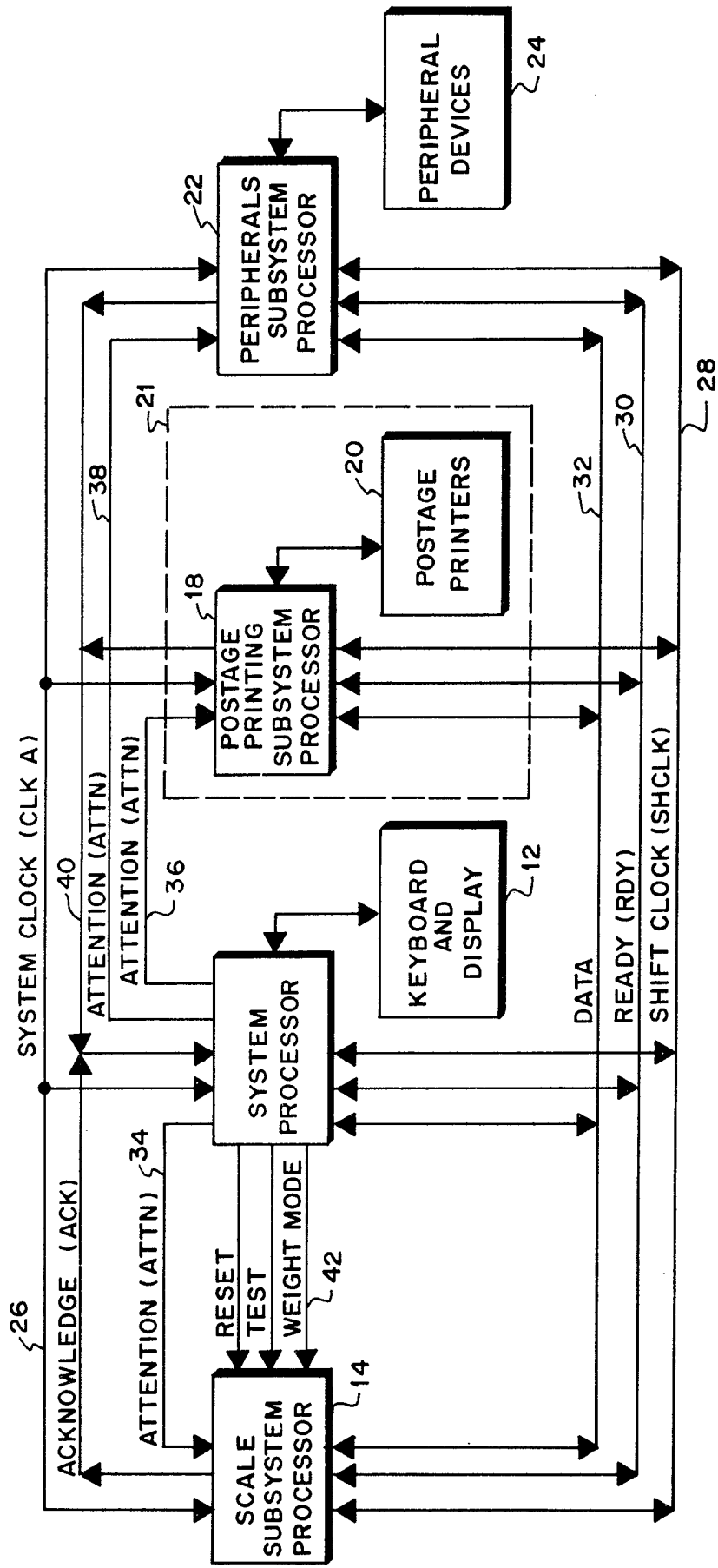


FIG. 1

PRIOR ART

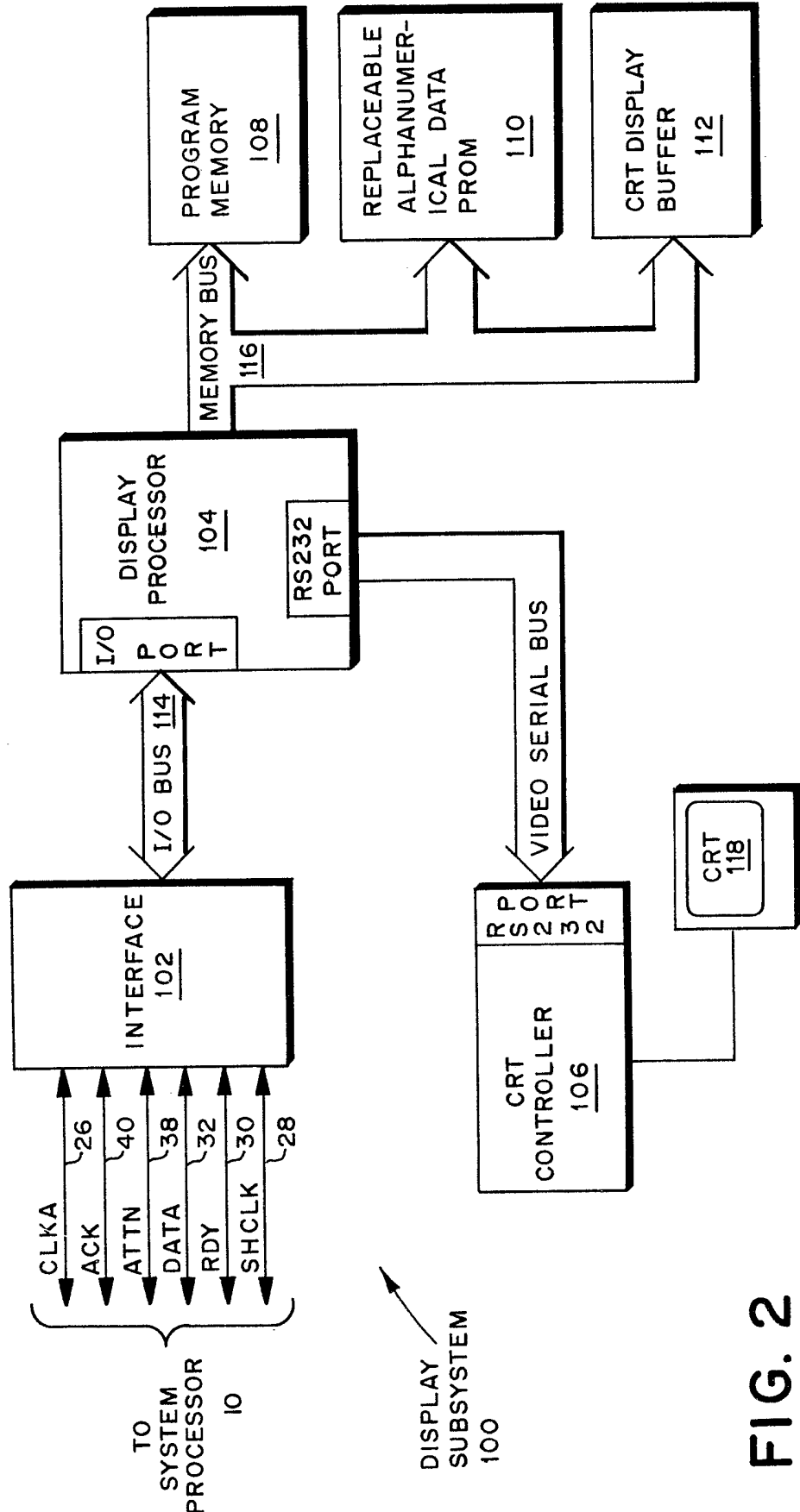


FIG. 2

FIG. 3

PRIOR ART

POUNDS		OUNCES		ZONE		DOLLARS/NUMBER DISPLAY			
13		15.5		11		\$164.27			

UPS INTER STATE	UPS INTRA STATE	UPS BLUE	INT'L SUR	INT'L AIR
1ST PRIOR	3RD 4TH	EXP	BOOK RATE	LIB RATE
REG	SPEC DEL	SPEC HAND	CUST RATE	OVER SIZE
RET REC	CERT	INS	COD	ZCZ

7	8	9
4	5	6
1	2	3
C	0	\$ +

PRINT

WT
ENTRY

WEIGHT:	lbs	ozs
CLASS:		
DESTINATION:		
BASE FEE:		
SPECIAL FEES:		
TOTAL:		

FIG. 4

WEIGHT:	13 lbs	15.5 ozs
CLASS:		
DESTINATION:		
BASE FEE:		
SPECIAL FEES:		
TOTAL:		

FIG. 5

WEIGHT:	13 lbs	15.5 ozs
CLASS:	INTERNATIONAL AIR	
DESTINATION:		
BASE FEE:		
SPECIAL FEES:		
TOTAL:		

FIG. 6

WEIGHT:	13 lbs	15.5 ozs
CLASS:	INTERNATIONAL AIR	
DESTINATION:	AFGANISTAN	
BASE FEE:	\$ 89.00	
SPECIAL FEES:		
TOTAL:	\$ 89.00	

FIG. 7

WEIGHT:	13 lbs	15.5 ozs
CLASS:	INTERNATIONAL AIR	
DESTINATION:	ZAIRE	
BASE FEE:	\$ 88.00	
SPECIAL FEES:		
TOTAL:	\$ 88.00	

FIG. 7a

WEIGHT:	13 lbs	15.5 ozs
CLASS:	INTENATIONAL AIR	
DESTINATION:	AFGANISTAN	
BASE FEE:	\$ 89.00	
SPECIAL FEES:		
CERTIFIED:	\$ 4.75	
(INSURANCE ?)		
TOTAL:	\$ 93.75	

FIG. 8

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WEIGHT:	13 lbs	15.5 ozs
CLASS:	INTERNATIONAL AIR	
DESTINATION:	AFGANISTAN	
BASE FEE:		\$ 89.00
SPECIAL FEES:		
CERTIFIED:		\$ 4.75
INSURED FOR \$10,000.		\$ 70.52
TOTAL:		\$ 164.27

FIG. 9

SPECIFICATION

A postage metering system with display

5 This invention relates to a postage metering system and to a display sub-system for same.

Automatic postage metering systems are known. Such systems comprise a scale for determining the weight of an item to be mailed, a system processor

10 for determining the applicable postage value in accordance with that weight and a postage meter operatively associated with the processor which is set with the applicable postage value and prints corresponding indicia on the item to be mailed. In 15 more sophisticated applications, the operator of such a system may have a keyboard to enter other information to be used in determining the applicable postage value into the system. Thus, the operator may enter information relating to destination, class 20 of service and/or special fees into the system and the system processor will determine the applicable postage value in accordance with the entered information and the weight of the item to be mailed.

Such a system is disclosed in U.K. Patent Application No. 2 057 169 A, inventors, Dlugos et al. The system disclosed in this document is capable of determining and imprinting postage values for domestic and foreign mail, both surface and air, as well as private carrier rates. A similar system is 30 disclosed in U.S. Patent No. 4,325,440 to Crowley et al. entitled COMPUTING SPECIAL FEES IN A PARCEL POSTAGE METERING SYSTEM which issued April 20, 1982. This system is structurally similar to that disclosed in the above mentioned Dlugos et al. 35 patent application and provides the further ability to include special fees, such as C.O.D., return receipt, etc., in the computed postage value.

These patents documents represent what applicants believe to be the closest prior art to the subject 40 invention and are hereby incorporated into the present application by reference.

While systems such as those taught in these patent documents have proved highly effective and advantageous in environments such as the mailing 45 rooms of large corporations, where large volumes of commercial mail are processed for a single mailer, they would not be suitable for application as "Postal Window Systems". "Postal Window Systems" are postage metering systems that would be installed in 50 post offices and individual mailers would bring one, or a few items, to be mailed and they, or an operator, would use the "Postal Window System" to determine the applicable postage value and imprint the corresponding indicia (franking value) on the item to 55 be mailed. Brief consideration of the patent documents referred to will show that they are unsuitable for such "Postal Window" applications. In particular, this is because the prior art postage metering systems determined an applicable postage value as 60 a single valued function of all information entered into the system. The postage value determined was an aggregate of all the information entered and no itemized breakdown of postage costs was provided, except that certain prior art postage mailing systems 65 briefly displayed only the dollar value of compo-

nents of the aggregate postage value. A typical such system is described in our European Published Patent Application No. 90630. It relates to a "Postage Value Determining Scale with Recall and Display of 70 Special Fees". While such aggregate postage values might be acceptable in corporate mailing rooms where experienced operators handle large volumes of items to be mailed for a single corporate mailer and a certain small percentage of errors may be 75 tolerated, they would not be acceptable to individual mailers mailing a small number of items. Thus, while a corporate mailer might tolerate one package in a thousand which was mailed with a wrong special fee, an individual mailer of single items would likely 80 not tolerate an error where, for example, the one item he or she mailed was not mailed special delivery when that was intended. Yet, seeing only an aggregate postage value, they would have no chance to recognize the error, except for the possibil- 85 ity that the erroneous postage value might be recognized as too low. And, of course, the possibility of such errors would greatly increase with systems where the inexperienced individual mailer would act as his or her own operator.

Moreover, because postage metering systems are, in effect machines for spending money the need for reliability and security is very great. Thus, it is important that in the development of new postage metering systems, such as "Postal Window Sys- 95 tems", tested hardware and software should be used to the greatest extent possible with the fewest modifications possible.

The present invention aims to provide a postage metering system which displays an itemized break- 100 down of the determined postage value.

The present invention provides a postage metering apparatus having a display for displaying components of a determined postage value and information identifying said components.

105 In a preferred embodiment, the postage metering system of the invention comprises a scale for determining the weight of an item to be mailed, a system processor for determining the applicable postage value in accordance with the weight of such item, a data bus for interconnecting these units and 110 an additional subsystem comprising the display of the invention operatively connected to the bus. A more preferred embodiment of the invention further comprises a keyboard having a keyset limited to 115 numeric keys and function keys for entering additional information, such as class of service, destination, etc., into the system processor to be used by the system processor in determining the applicable postage value and the system processor transmits 120 such information to the display subsystem for display.

And, in a yet more preferred embodiment of the invention, the display subsystem comprises a display processor, a display device operatively con- 125 nected to the display processor for displaying alphanumeric information and a memory operatively connected to the display processor. The memory stores data defining display routines and formats and alphanumeric data codes corresponding to the 130 various components of the postage values. The

display processor uses these codes to display the components of the determined postage value in a predetermined format and in alphanumeric form.

The system of the subject invention illustrated herein is particularly advantageous in that it provides for the display of components of the determined postage value in a readily understandable alphanumeric format without the need for extensive reprogramming of the system processor so that confidence in the validity of the postage value determining routines may be maintained.

The invention will be better understood from the following non-limiting description of an example thereof given with reference to the accompanying drawings in which:-

Figure 1 is a schematic block diagram of a prior art postage metering system.

Figure 2 is a schematic block diagram of one example of a display subsystem in accordance with the subject invention.

Figure 3 is a plan view of a prior art keyboard used with postage metering systems.

Figures 4-9 show the display produced by the display subsystem of *Figure 2* during various stages of a postal transaction.

Figure 1 shows a schematic block diagram of a prior art postage metering system. This system comprises a scale (not shown) and scale subsystem processor 14 which together comprise a scale means for determining the weight of items to be mailed, a system processor 10 for determining the applicable postage value for such an item in accordance with the weight of such item and other information provided by an operator through keyboard 12, a postage meter 21 for imprinting such items with indicia corresponding to the determined postage value and a peripheral systems processor 22 which controls various peripheral devices 24. Such peripherals might include, for example, a parcel identification number printer, a journal printer for printing accounts of transactions or an electronic accounting system.

The above-described subsystems are interconnected by a data communications bus comprising a number of common, bidirectional lines including clock lines 26 and 28, ready line 30, serial data line 32 and acknowledge line 40 and a second number of dedicated attention lines 34, 35 and 38 connecting system processor 10 with each of the other subsystems. Acknowledge lines 34, 36 and 38 are controlled by system processor 10 and are used to establish communications between system processor 10 and other subsystems.

A more complete understanding of the operation of such a postage metering system, and particularly the determination of the base postage feed and special fees which are the components of the determined postage value, may be obtained by reference to the above-incorporated U.S. patents and a detailed description of the operation of the data communications bus may be found in U.S. Patent No. 4,308,579, to Dlugos, entitled MULTIPROCESSOR PARCEL POSTAGE METERING SYSTEM HAVING SERIAL DATA BUS, which issued December 29, 1981 and which is hereby incorporated by

reference.

Turning now to *Figure 2*, there is shown a display subsystem 100 which may be substituted for peripherals subsystem processor 22 and peripheral devices 24 to form the postage metering system of the subject invention.

An interface 102 is provided as part of display subsystem 100 and connects the above-described data communications bus to I/O bus 114 to transfer data from system processor to display processor 104. This data identifies the various components of the determined postage value. In accordance with program instructions stored in program memory 100, processor 104 transfers alphanumeric data from PROM 110 into CRT display buffer 112. This alphanumeric data identifies and defines the particular values of the various components of the particular postage value determined. CRT controller 106, in response to commands from processor 104, displays the data on CRT 118. Data may be transferred from buffer 112 through a serial RS232 channel integral to processor 104 and controller 106, as shown in *Figure 2*.

As will be apparent to those skilled in the art, controller 106 and CRT 118 may be any of a number of commercially available units comprising a CRT, controls, refresh buffer or buffers, character generator and appropriate power supplies and auxiliary circuitry.

It should be noted that the display of alphanumeric data on CRT's under processor control is a conventional technique well known to those skilled in the art as is the design of interfaces, such as interface 102, connecting processors to various bus structures. Thus, the detailed design of the subsystem of *Figure 2*, as well as other architectures for carrying out the same functions, is considered well within the routine skill of those skilled in the art and a detailed discussion of the detailed design of this subsystem is not believed necessary to an understanding of the subject invention.

It should also be noted that while it will be obvious to those skilled in the art that memories 108, 110 and 112 could readily all consist of portions of a single memory device there are advantages to using a replaceable PROM. In particular, as names of countries change or postal service between countries changes, replacement PROMs may be provided from a central source without the need to reprogram each system in use.

Turning to *Figure 3*, there is shown a conventional keyboard 12 used with prior art postage metering systems. Such keyboards include a plurality of special function keys, numeric keys and clear and print keys. To simplify operation of the postage metering system, as well as to reduce costs, functional keys are used in place of a full alphanumeric keyboard. Thus, when non-numeric information, such as the name of a destination country, is entered, it must be entered as a numeric code. Keyboard 12 also includes a limited numeric display for displaying item weight, mailing zone and a dollar value or other numeric values.

In general, the operation of prior art mailing systems using such keyboards is well known and is

described in the above-incorporated U.S. patents. However, operation of the postage metering system of the subject invention will be described in conjunction with Figures 4-9 to illustrate the display feature

5 of the subject invention. As an example, consider a postal service customer who wishes to mail a package airmail, certified to Afghanistan. When the customer approaches the postal window, he observes display CRT 118 showing only a blank
10 format on the screen, as shown in Figure 4. The customer then gives the package to the clerk/operator with appropriate mailing instructions. The clerk/operator places the package on the scale and subsystem processor 14 transfers the weight information to system processor 10 which displays it on the keyboard 12 in a known manner described in the above-incorporated U.S. patents. System processor 10 also transfers the weight to display subsystem 100 which displays it as shown in Figure 5. The
20 clerk/operator then depresses the International Air key and system processor identifies the class of service requested and transmits a code identifying the class to display system 100. Under control of the program stored in memory 108, display processor 25 matches the requested class with appropriate alphanumeric data codes in PROM 110 and displays this information as shown in Figure 6. At this point, the operator must enter the appropriate country code as a three digit number. System processor 10 now
30 proceeds to determine the applicable base fee in accordance with a known routine as disclosed in incorporated U.S. Patent No. 4,286,325. System processor 10 also transmits the country code, base fee and total fee to display subsystem 100 and display processor 104 matches the country code with the appropriate alphanumeric data stored in PROM and displays the information as shown in Figure 7.

Assuming for a moment the operator erred in
40 entering the country code, the display might appear as shown in Figure 7a. Display of an improper destination would alert the customer and the clerk/operator to the error and the erroneous entry could be cleared and the information re-entered. Note that
45 without such a display such an error might well pass unnoticed.

Once the correct country code is entered and the base fee determined, the clerk/operator now depresses the "Certified" key and system processor 10
50 determines the appropriate special fee and transmits the amount and type of special fee to display subsystem 100 and display processor 104 again selects and displays the information as shown in Figure 8. At this point, the display may also prompt
55 the customer. In the example shown in Figure 8 insurance is suggested.

Assuming the customer wishes insurance, the clerk/operator depresses the "Insurance" key, enters the amount of insurance and the additional fee is
60 determined, transmitted to display subsystem 100 and displayed as shown in Figure 9. After confirming the transaction with the customer, the clerk/operator depresses the "Print" key and appropriate indicia are printed in a known manner.

65 Those skilled in the art will recognize that the

computation of base and special fees by system processor 10 may be carried out without substantial change in the methods taught in the incorporated U.S. patents, requiring only the addition of and I/O
70 routine for communication between system processor 10 and display subsystem 100. This is a particularly important advantage since it helps to preserve the assurance of validity processed by the extensively tested programs used in prior art postage metering systems. Applicants also wish to point out again that the display of alphanumeric characters under processor control is conventional, as is programming of display processor 104 to perform the described functions, and is believed to be well within
75 the normal abilities of a person skilled in the art.

It will be seen that the system particularly disclosed and illustrated herein provides a display by a readily separable subsystem which is not closely coupled to the system processor; and moreover
80 provides a postage metering system which is suitable for use as a "Postal Window system" where numerous individuals mail small numbers of items and it is highly important that each item be mailed correctly.

The above-detailed description is provided by way of illustration only and other embodiments of the present invention will be readily apparent to those skilled in the art. Thus, in place of substituting display subsystems 100 for peripheral subsystem
90 processor 22 and peripherals 24, display subsystem 100 may be incorporated in addition to such peripherals or if a sufficiently powerful processor is used, the functions may be combined. Similarly, if a sufficiently powerful processor is used, it is within
95 the contemplation of the subject invention to multiplex a single display subsystem between a plurality of system processors and corresponding plurality of displays. Also, a printer or LED display may be used in place of a CRT display.

The invention is therefore not to be construed as limited to the details of the illustrated example of the invention.

CLAIMS

110 1. A postage metering apparatus having a display for displaying components of a determined postage value and information identifying said components.

115 2. Apparatus according to claim 1 wherein said components and said information are displayed prior to printing of indicia corresponding to said postage value so that said postage value may be corrected if information incorrectly defining said components has been entered into the apparatus.

120 3. Apparatus according to claim 1 or 2 wherein said display comprises a CRT.

4. Apparatus according to claim 3 which is a postal window system and display is provided for a customer using said postal window system.

125 5. Apparatus according to any one of claims 1-4 comprising a weighing scale for determining the weight of an item to be mailed, a system processor for determining the applicable postage value in accordance with the weight of such item, a postage

meter for imprinting corresponding indicia and a data communications bus interconnecting said scale, said system processor and said postage meter, and wherein said display comprises an additional distinct subsystem operably connected to said bus.

6. Apparatus according to claim 5 further comprising a keyboard operatively connected to said system processor for operator entry of additional information to be used in determining said applicable postage value into said system processor, said keyboard comprising a set of keys consisting of function keys and numeric keys, whereby information may be entered into said system processor as a combination of function codes or function codes and associated numeric values or numeric codes, said system processor transmitting components of said determined postage value to said display subsystem along with information identifying said components, so that said components may be identified and displayed.

7. Apparatus according to claim 6 wherein said display subsystem comprises a display processor, display means operatively connected to said display processor for displaying alphanumeric information and memory means for storing data operatively connected to said display processor, said stored data including data defining display routines and formats and alphanumeric data codes corresponding to said component identifying codes, whereby said display subsystem may display said components with identifying information in a predetermined format in alphanumeric form so that said information is readily recognizable.

8. Postage apparatus of the type comprising a scale for determining the weight of an item to be weighed, a system processor for determining applicable postage values in accordance with said determined weight, a postage meter for imprinting corresponding indicia on such item and a data communications bus interconnecting said scale, system processor, and postage meter, characterised by a display subsystem, operatively connected to said bus, for displaying components of said determined postage values and alphanumeric information identifying said components, said postage values being the sum of said components.

9. Apparatus according to claim 8 in which the display subsystem includes display means for displaying alphanumeric information, and the apparatus further comprises:

(i) memory means for storing data, said data including data defining alphanumeric information identifying components of postage values; and
(ii) a display processor means operatively connects to said display means, said memory means and said bus for receiving from said system processor information identifying and defining components of postage values, and for matching said identifying alphanumeric data with said components and for controlling said display means so that said components are identified and displayed in a predetermined alphanumeric format.

10. A display subsystem for use with a postage metering system having a system processor, said

subsystem comprising:

(a) display means for displaying alphanumeric information

(b) memory means for storing data, said data including data defining alphanumeric information identifying components of said postage values; and

(c) a display processor means operatively connected to said display means, said memory means and said system processor, for receiving from said system processor information identifying and defining said components of postage values, and for matching said identifying alphanumeric data with said components and for controlling said display means so that said components are identified and displayed in a predetermined alphanumeric format.

11. A subsystem according to claim 10 in combination with a postage metering system which comprises a scale, a system processor, a postage meter and a data communications bus interconnecting said scale, system processor and postage meter, said display processing means being operatively connected to said bus.

12. A postage metering apparatus substantially as herein described with reference to and as illustrated in the accompanying drawings.

13. Any novel combination or sub-combination disclosed and/or illustrated herein.