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(54) Weighing apparatus

(57) Apparatus for computing prices comprises one or more weighing machines 2 with outputs linked to a computer system. Other information such as customer identification or price per unit weight can be fed into the computer from a keyboard 5 or from a central processor 6. Display and print-out facilities 7, 8 are provided which can give the sum of all a customer's purchases.

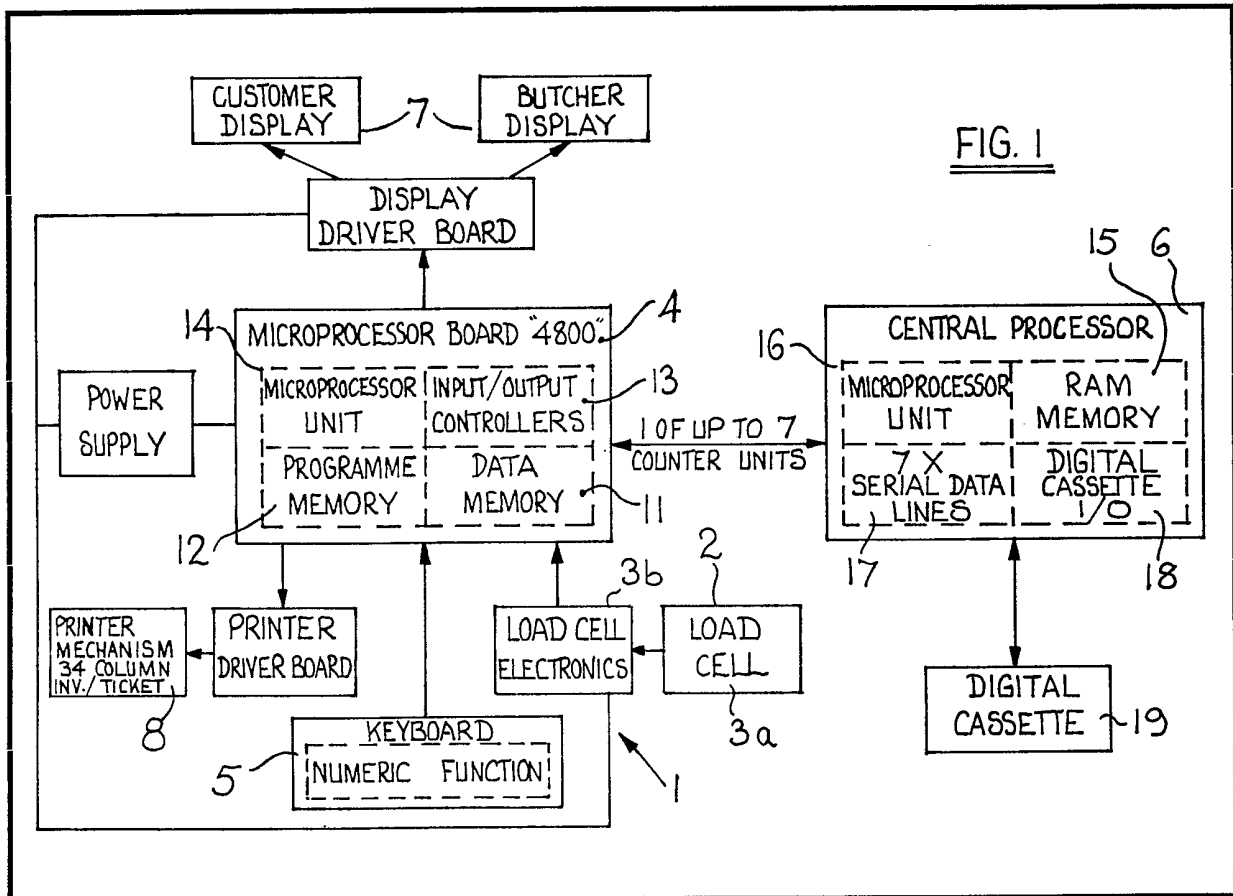
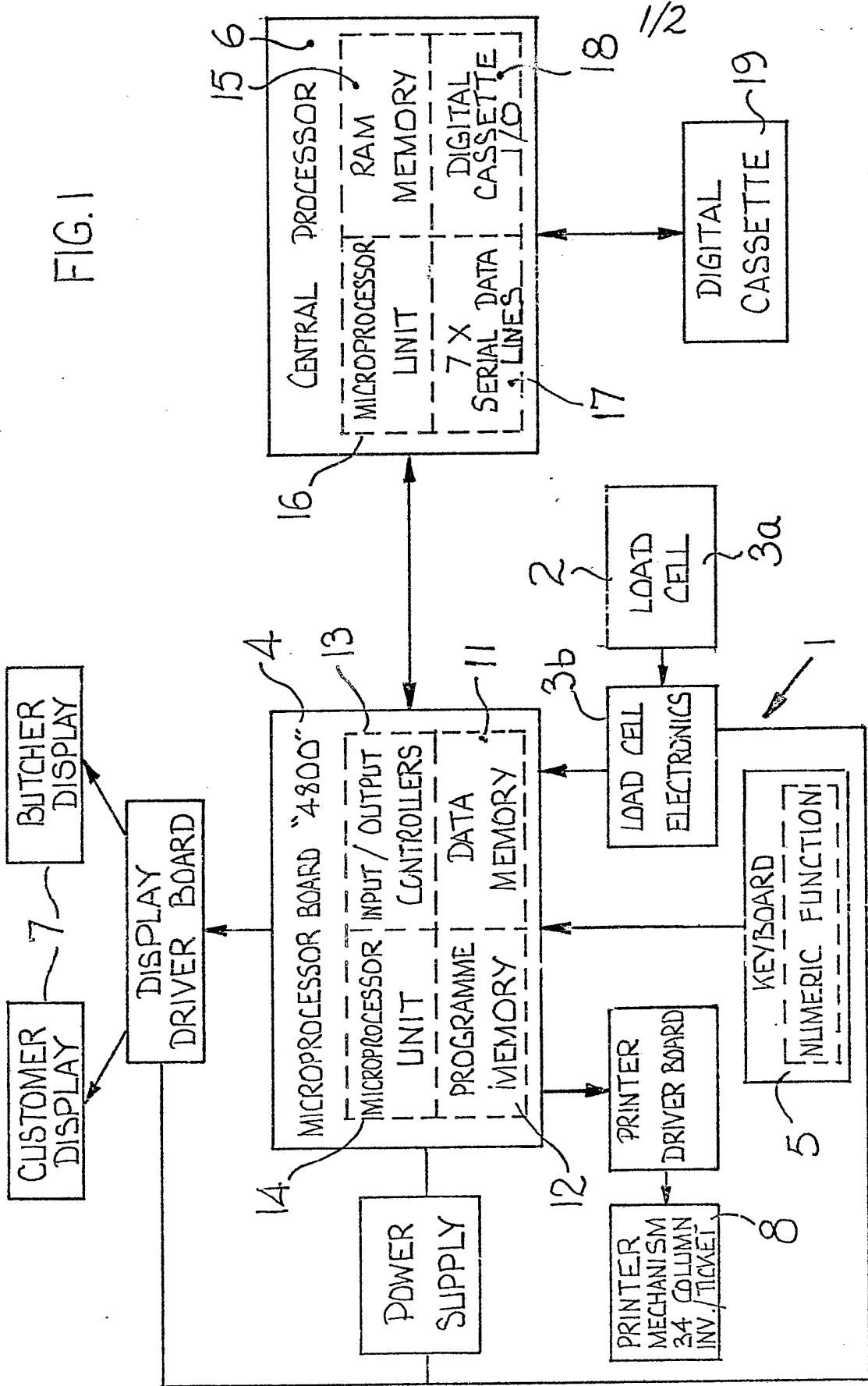


FIG. 1

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

FIG. 1



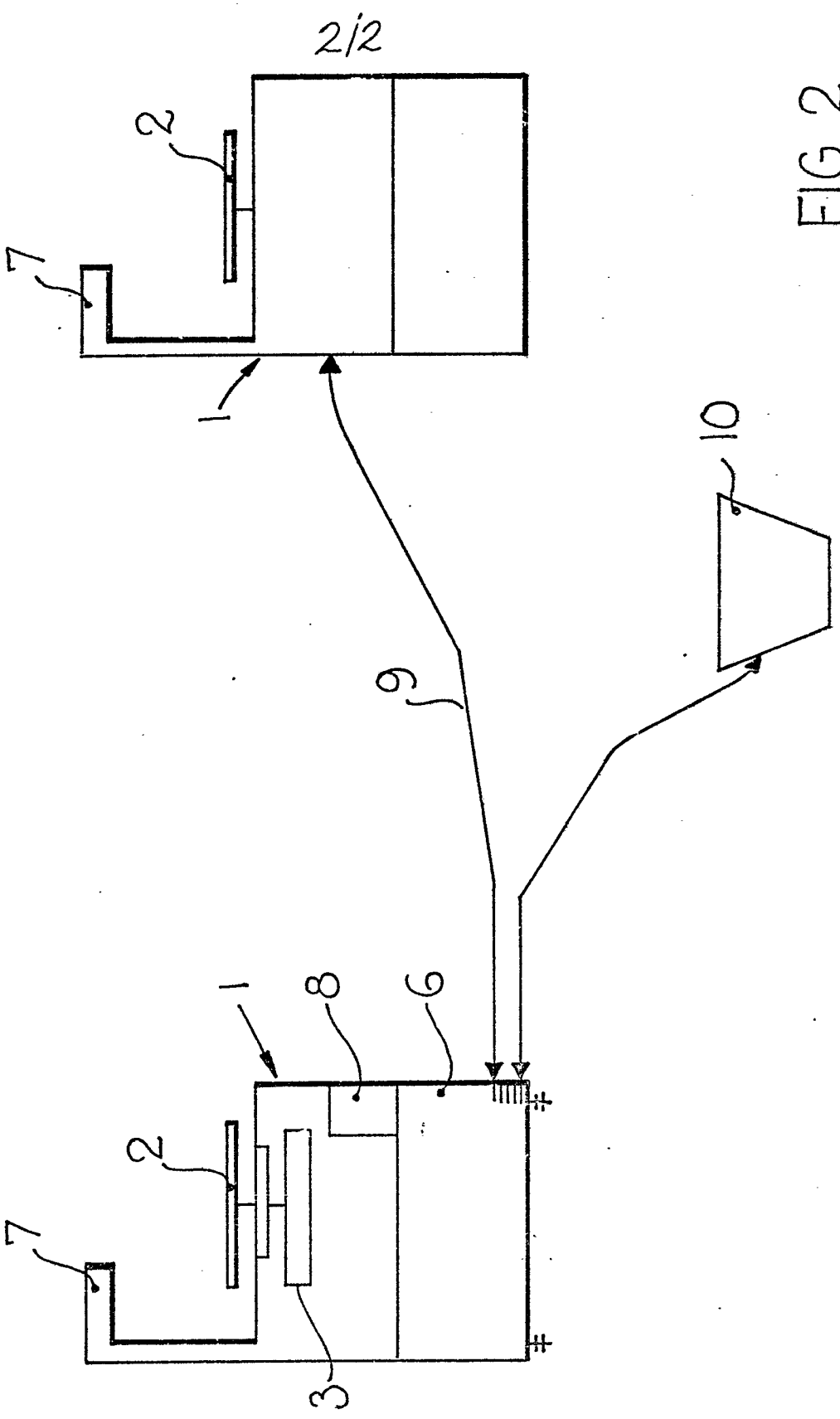


FIG. 2

SPECIFICATION

Improvements in or relating to methods of and/or apparatus for sales

5 This invention relates to methods of and/or apparatus for sales.

10 It is an object of the present invention to provide methods of and/or apparatus for sales which will at least provide the public with a useful choice.

15 Accordingly in one aspect the invention consists in a method of sales, said method comprising the steps of setting up a weighing machine to weight an article and to compute the price of that article at a presettable rate per kilogram, automatically transferring the calculated price to a storage; weighing further articles for purchase by the same customer; 20 establishing the price thereof at the same or one or more different weighing machines; transferring the further computed price or prices to said storage and then requesting from said storage a computation of the sum of the prices of the various articles, the prices of which have been stored to be delivered to any selected one of said weighing machines so that a purchaser may purchase articles at varying positions and have a final bill presented at any one of those positions.

30 In further aspect the invention consists in apparatus for sales, said apparatus comprising one or more weighing machines, each weighing machine having associated with it interface means which convert the weight of an article into a signal such as a series of pulses, a manually operable means operable to apply a selected one of a plurality of charge rates to the signal received indicating the weight of the article so that a price for that article 40 formed by the product of the weight of the article by the charge rate per unit weight is given, price indicating means to indicate said price, connecting means connecting the or each said weighing machine and associated apparatus to a storage means, the construction and arrangement being such that in use an operator places articles to be weighed on the or any one of said plurality of weighing machines, sets up the price for that article, 50 operates the weighing machine to cause the price of the article being the product of the price rate and the weight to be transmitted to said storage means and after a customer has selected one or more articles the price of which is recorded at one or more of said stations against a code for that customer, the operator at the or any selected weighing machine interrogates said storage means so that 60 the sum of the or all the customers' purchasers is indicated and a charge made accordingly.

65 To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and

applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the description 70 herein are purely illustrative and are not intended to be in any sense limiting.

One preferred form of the invention will now be described with reference to the accompanying drawings in which,

75 *Figure 1* is a schematic block diagram of apparatus for sales according to the invention, and

80 *Figure 2* is a diagrammatic representation of one form of apparatus for sales according to the invention.

In the preferred form of the invention one or more and preferably a plurality of weighing stations 1 are provided. One such station being indicated by the dotted lines in Fig. 1 85 and two stations 1 being shown in Fig. 2. Each weighing station 1 has a weighing machine 2 arranged so that when an article is placed thereon a signal is given which can be interpreted to indicate the weight of the article 90 placed on the weighing machine. Thus, for example, the scale may apply pressure to a load cell 3a and digitiser 3b so that as the pressure on the load cell 3a increases the electrical resistance of the load cell changes. 95 The digitiser or transducer, for example, an analogic 5315 then converts the pressure changes indicated by the load cell into a signal such as for example, a series of pulses, so that the series of pulses indicate when 100 suitably read, the total weight of the article. Some damping may be necessary so that the final output is indicative of the actual weight and does not give a spurious indication of weight due to oscillation of the weighing 105 platform 2. Thus, the load cell 3a and digitiser 3b are one form of an interface means to convert the weight of an article into a signal such as a series of pulses. The signal from the load cell 3a and digitiser 3b and delivered to 110 a processing unit 4 such as micro-processor board. A manually operable means is provided operable to apply a selected one of a plurality of charge rates to the signal received by the processing unit 4 so that a price for that 115 article, which price is formed by the product of the weight of the article by the charge rate per unit weight, is given. This may be achieved by providing at the weighing station 1 the manually operable arrangement which is 120 associated with the interface means for example, a keyboard 5, on which an operator can key a code indicative of a charge out rate per unit weight, for example, cents per kilogram in relation to the particular articles being 125 weighed, for example, sausages or steak in a butcher shop. Operation of the key board 5 will cause the required data or signals representing the required data to be drawn from a shop controller unit which includes for example, a storage unit and may comprise a micro-

processor such as a Motorola 6800 series. The signals received from the shop controller unit 6 are fed to the processing unit 4 so that the required operation may be performed.

5 Also associated with the interface 3 may be provided a display unit 7 and a print out unit 8 for example, the display unit 7 is preferably such that the price per unit, the weight and the value for that article are indicated in
10 relatively large numerals and also preferably an alphabetic representation of the article purchased is also provided. The printout may provide similar information.

Means are also provided associated with the
15 key board 5 so that a code to indicate a particular customer is capable of being selected by the operator. Alternatively, the code may indicate the operator; the operator being active in particular for only one customer at a
20 time. The pricing schedule is preferably retained in a core storage in the shop controller unit 6 and it is envisaged that this could be regularly up-dated by a cassette recording system so that a new cassette may be inserted,
25 the information on the latest on the pricing schedule, being then transferred to the core storage to replace the earlier pricing schedule contained therein. Each of the series of weighing stations 1 is electronically connected by a suitable connecting means such as cables to a storage means which preferably forms part of the shop controller unit 6. The shop controller unit 6 may be retained in conjunction with one of the weighing machines
35 which thereby has internal connections and further weighing machines 1 may be connected for example, by cables 9. The shop controller unit may also comprise a mini computer or other electronic device such as a calculating machine situated in the shop
40 where the sales take place. The storage means preferably includes substantially permanent recording means such as tapes or magnetic discs as above outlined on which the information can be recorded for a reasonably long period of time for example, at least one week to one year without deterioration but so that up-dated information can be supplied as above described if required. It is also desirable that provision be made for, for example, cassettes such as the inload cassette to be able to record transactions of a day's service so that these transactions may be analysed for example, in a remote computer of the computer in that shop so that accurate records may be kept
55 stocks consumed, the most popular stocks, the time of day during which the sales are made and other factors useful in the marketing of the products sold in the shop.

60 It is also desirable that the shop controller unit 6 be connected to a cash register 10 which only opens when a correct invoice total is entered. And to this end, at the end of a sale a total amount is provided from the
65 printer and this amount must be keyed into

the cash register before it will open. In order to ensure than only a correct total will cause the cash register to open a check figure can be introduced calculated in any desired way
70 for example, from the total printout sales figure and the operator or customer number so that this check figure which would also be indicated on the printed out sales total must also be keyed into the cash register before
75 opening of the cash register can occur.

Referring to the processor board 4 the data memory 11 reads and stores input data for example from the scales 2 and a programme memory 12 is also provided. The input/output controller 13 serves an "exchange" function and the micro-processor unit 14 performs the required computing functions such as information filing and finding.

Referring now to the central processor or
85 shop control unit 6 and memory 15 serves both data and programme memory functions and micro-processor unit 16 serves a similar function to the unit 14. The serial data lines 17 provide communication with micro-processor board or boards 4 and the input and output area 18 communicates with the digital cassette function 19.

The electronics for the micro-processor board 4 can be derived by the application of
95 standard techniques and can be fabricated from existing and available elements if required.

The operation of the construction is as follows.

100 Assuming that the equipment is provided in a butcher shop a customer instructs a butchers as to that customers' requirement for example, a kilogram of sausages, a kilogram of steak, a kilogram of stew beef and so on.
105 This product may be weighed on a single weighing machine or if these products are in different parts of the shop, the products may be weighed on different weighing machines. The butcher weighs out the sausages for
110 example at a first weighing station and records on the keyboard of that machine the code for sausages for example say code 22. The machine automatically records the weight, multiplies the weight by the price per
115 unit weight (such unit price being held in the machine or being entered at the key board at the time of sale) and transmits the value for that particular purchase to the shop controller unit storage facility against that customer or
120 operator's code. If now steak is supplied from a different position or indeed the same position the shopkeeper weighs the steak on the same machine or a machine at a more convenient station and records the next purchase
125 and so on until the customer has completed all purchases. At the end of this time the operator presses a suitable operating key on the key board at any selected station requesting information from the storage means as to
130 the total of sales for that customer and the

value thereof. This is recorded on the printout and the record of all the sales made delivered together with the sum of the cost of those sales whereupon the customer pays the
 5 butcher. Where a cash register facility is provided, the butcher keys the total sales and check number into the cash register which opens for the money to be deposited. As
 10 stated above at suitable intervals the stored information may be analysed either on the computer in that shop or in a central computer.

From the foregoing it will be seen that at least in the preferred form of the invention a
 15 customer can have records kept of purchase even though they are made at widely different parts of the shop, such purchases being eventually summed up and so that both the
 20 butcher or other shopkeeper and the customer knows that the results are accurate. Stock control is also facilitated. It is also an advantage of the present invention that errors in price computation which can occur with traditional sales method can be substantially eliminated as an accurate record is kept for the
 25 purchases made and also summation and calculation of the prices charged for each article are achieved by other than manual methods. Where the cash register facility is provided,
 30 opening of the cash register when the amount and checked figure is correctly keyed or cause an entry to be made in the storage unit indicating that payment has been made for that sale.

35 CLAIMS

1. A method of sales, said method comprising the steps of setting up a weighing
 40 machine to weigh an article and to compute the price of that article at a presettable rate per kilogram; automatically transferring the calculated price to a storage; weighing further
 45 articles for purchase by the same customer; establishing the price thereof at the same or one or more different weighing machines; transferring the further computed price or
 50 prices to said storage and then requesting from said storage a computation of the sum of the prices of the various articles, the prices of which have been stored to be delivered in any
 55 selected one of said weighing machines so that a purchaser may purchase articles at varying positions and have a final bill presented at any one of those positions.

2. A method of sales substantially as herein described with reference to the accompanying drawings.

3. Apparatus for sales, said apparatus comprising one or more weighing machines,
 60 each weighing machine having associated with it interface means which convert the weight of an article into a signal such as a series of pulses, a manually operable means operable to apply a selected one of a plurality
 65 of charge rates to the signal received indicat-

ing the weight of the article so that a price for that article formed by the product of the weight of the article by the charge rate per unit weight is given, price indicating means to
 70 indicate said price, connecting means connecting the or each said weighing machine and associated apparatus to a storage means, the construction and arrangement being such that in use an operator places articles to be
 75 weighed on the or any one of said plurality of weighing machines, sets up the price rate for that article, operates the weighing machine to cause the price of the article being the product of the price rate and the weight to be
 80 transmitted to said storage means and after a customer has selected one or more articles the price of which is recorded at one or more of said stations against a code for that customer, the operator at the or any selected weighing
 85 machine interrogates said storage means so that the sum of the or all the customers' purchases is indicated and a charge made accordingly.

4. Apparatus for sales as claimed in Claim
 90 3 wherein said manual means comprises a manually operable keyboard.

5. Apparatus for sales as claimed in either Claim 3 or Claim 4 wherein a printout mechanism and a display mechanism are associated
 95 with each station at which a weighing machine, interface and keyboard are provided.

6. Apparatus for sales as claimed in any one of Claims 3 to 5 wherein said storage means comprises a micro-computer and associated similar electronic storage means.

7. Apparatus for sales as claimed in any one of Claims 3 to 6 wherein said storage means includes a series of reasonably permanent records which can be transported or
 105 transmitted to a further computer for analysis or may be analysed in said computer to give selected results on analysis.

8. Apparatus for sales as claimed in any one of Claims 3 to 7 further including a cash
 110 register and connection means between said cash register and said storage means whereby said cash register may be caused not to open until a correct total indicating the total purchase price and a check figure are provided to
 115 said cash register.

9. Apparatus for sales substantially as herein described with reference to the accompanying drawings.