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(54) Title: METHOD AND SYSTEM FOR PLANNING AND MONITORING CALORIE CONSUMPTION

Figure 8

(57) Abstract: A system for planning calorie consumption comprising means for determining a recommendeed daily calorie intake value for a user; means for determining the calorie value of a mean to be consumed by the user; and means for determining the time at which the amount of calories in the meal consumed by the user will be expended with reference to the user's recommended daily calorie intake value.
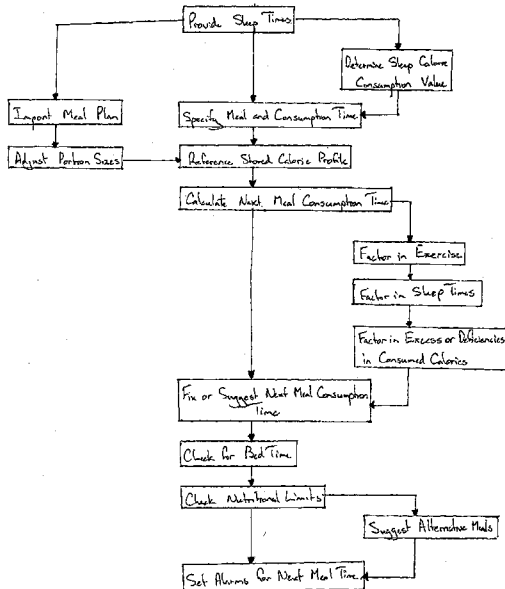
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"METHOD AND SYSTEM FOR MONITORING AND PLANNING CALORIE CONSUMPTION"

FIELD OF THE INVENTION

[0001] The invention relates to a method and system for monitoring and planning calorie consumption. The invention is particularly suited to advising a person as to when they should next consume calories based on current and/or planned activity levels and based on past calorie consumption activity.

BACKGROUND TO THE INVENTION

[0002] The following discussion of the background to the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgment or admission that any of the material referred to was published, known or part of the common general knowledge in any jurisdiction as at the priority date of the application.

[0003] Current thinking surrounding calorie intakes varies. While the standard calorie counter model makes allowance for age and sex, other models have been developed which also take into account such factors as the person's weight and height. Typically, these models have supplementary constants which are to be applied to the referenced calorie intake value to account for calories burnt during exercise.

[0004] In all cases, however, the recommended calorie intake value is determined on a daily basis and is a generalisation without real reference to the circumstances of the person concerned. In doing so, this exposes current thinking to a range of problems.

[0005] The key such problem identified by the applicant, and the one which this invention primarily seeks to address, is that of *how* the recommended daily calorie intake is consumed. To elaborate, under the current thinking models, the person concerned may consume the full recommended intake in a single meal. This may then leave the person concerned with energy issues, either in the form of not having sufficient energy prior to eating to undertake their normal routine or in the form of having their existing energy diverted to cover digestion of the meal.

[0006]Another problem associated with how the recommended daily calorie intake is consumed relates to the rate of consumption. The rate of calorie consumption during waking hours exceeds the rate of calorie consumption during sleep. By extension, the rate of calorie consumption during exercise exceeds the rate of calorie consumption during normal waking hours. Even between hours spent exercising, the rate of calorie consumption may vary depending on the type(s) of exercise being undertaken.

[0007] It is therefore an object of the present invention to provide a method and system that relates calorie consumption in minutes so as to allow a user to more accurately plan for and/or track when they need to consume more calories.

SUMMARY OF THE INVENTION

[0008]Throughout this document, unless otherwise indicated to the contrary, the terms "comprising", "consisting of", and the like, are to be construed as non-exhaustive, or in other words, as meaning "including, but not limited to".

[0009] In accordance with a first aspect of the invention there is a system for planning calorie consumption comprising:

> means for determining a recommended daily calorie intake value for a user; and

> means for determining the calorie value of a meal to be consumed by the user; and

> means for determining the time at which the amount of calories currently consumed by the user will be expended with reference to the user's set of demographic information.

[0010]The system may further include means for determining a set of demographic information regarding a user and the means for determining a recommended daily calorie intake value for the user does so based on the set of demographic information. The set of demographic information preferably includes at least one of the following: sex; age; weight.

[0012]The recommended daily calorie intake value for the user may be determined by multiplying the weight of the user by a standard calorie per kilogram value

calculated with reference to the remainder of the user's demographic information. The recommended daily calorie intake value for the user may also be determined based on a generalised level of the user's physical activity undertaken. Furthermore, the recommended daily calorie intake value may include a discretionary constant to account for small changes in daily calorie requirements over time.

[0013] The means for determining the time at which the amount of calories currently consumed by the user may calculate a ratio value (the TVC ratio) representing the user's recommended daily calorie intake as determined on a per minute basis, and the time needed to expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

[0014] The means for determining a recommended daily calorie intake value for the user may include a heart rate monitor, the recommended daily calorie intake value for the user being determined by reference to measurements taken by the heart rate monitor. Preferably, the recommended daily calorie intake value for the user is determined by reference to measurements taken by the heart rate monitor over a twenty-four hour period.

[0015] Alternatively, the means for determining a recommended daily calorie intake value for the user may calculate a ratio value (the TVC ratio) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, and multiplying the TVC ratio by 1,440 to determine the recommended daily calorie intake value for the user. As a further alternative, the means for determining the time at which the amount of calories currently consumed by the user may calculate a ratio value (the TVC ratio) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, where the time needed to expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

[0016] The means for determining the time at which the amount of calories consumed by the user will be expended may be made with reference to a set of calorie

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consumption values. The set of calorie consumption values may be determined by, or derived from, measurements taken by a calorie monitoring device.

[0017] The system may further comprise a planning means, the planning means operable to allow the user to specify a set of meals to be consumed over a specified time period and, following specification, to determine the specific instances of time during that time period when each meal in the set of meals should be consumed. The user may specify at least one time period within the specified time period when the user will be asleep.

[0018] The planning means may further operate to determine a sleep calorie consumption rate and a waking calorie consumption rate for the user, the planning means thereafter operable to determine the time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

the sum of all calories already expended up to the time the last meal was consumed; and

for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR

otherwise, the waking calorie consumption rate,

this time being the time at which the next meal in the set of meals should be consumed.

[0019] The sleep calorie consumption rate and a waking calorie consumption rate may be based on measurements provided by a heart rate monitor.

[0020] The time period when the user should consume their next meal may be determined according to the following formula:

$$TTNM = ((NTTNM - BT) \times SCCR) / WCCR$$

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where:

TTNMM = Time to Next Meal;

NTTM = an original calculated time to next meal as determined by reference to a flat per minute calorie expenditure rate;

BT = a user's notional bed time;

SCCR = a sleep calorie consumption rate; AND

WCCR = a waking calorie consumption rate.

[0021] The planning means may be further operable to allow the user to specify a set of meals to be consumed over a specified time period and the specific instances in times within the time period when each meal in the set of meals is to be consumed, where as each meal in the set of meals is specified, the planning means further operates to suggest a time when that meal should be consumed with reference to the sum total of calories already specified in the set of meals to be consumed

[0022] Alternatively, the planning means may operate to determine the suggested time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

the sum of all calories already expended up to the time the last meal was consumed; and

for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR

otherwise, the waking calorie consumption rate,

this time being the time at which the next meal in the set of meals should be consumed.

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[0023] An alarm may be issued to the user at each specific instance in time when a meal in the set of meals is to be consumed.

[0024] The planning means may warn the user if the total calories to be consumed by the user through each meal in the set of meals does not equal the user's recommended daily calorie intake value as adjusted for the duration of the specified time period.

[0025] The set of meals to be consumed can be updated on a real-time basis, the planning means thereafter operable to recalculate or re-suggest, as appropriate, the time when the next meal in the set of meals should be consumed.

[0026] The planning means may operate to suggest alternative and/or additional meals to the user where the specified set of meals do not met the user's recommended daily calorie intake value as adjusted for the duration of the specified time period. It is preferred that the specified time period be twenty four hours.

[0027] The planning means may be operable to plan meals over a set of specified time periods, and where the excess or deficit of calories consumed relative to the user's recommended daily calorie intake value for a specified time period is carried over to the next successive time period in the set of specified time periods. The user may be shown the times and dates at which each meal in the set of meals to be consumed should be consumed in a calendar format.

[0028] The planning means may operate to import a set of specified meals along with a recommended calorie intake value for the user who created the set of specified meals, the planning means thereafter operable to adjust the portion size of one or more of the set of specified meals in accordance with the variation in recommended calorie intake values for the user and the user who created the set of specified meals.

[0029] The system may further include means for specifying a set of activities and where the means for determining the time at which the amount of calories currently consumed by the user will be expended is made with additional reference to the set of activities. The means for specifying the set of activities may allow the user to specify a set of planned activities by reference to one or more records of an activity database.

[0030] The means for determining a recommended daily calorie intake value for a user is determined according to the following formula:

$$MDRCI = PDRCI + EECC - (TSE \times WCCR)$$

where:

MDRCI = a modified daily recommended calorie intake;

PDRCI = a daily recommended calorie intake for a person of similar demographics to the user not engaged in exercise;

EECC = an amount of calories consumed through exercise;

TSE = an amount of time, as a decimal figure, representing the time spent exercising; and

WCCR = a waking calorie consumption rate

[0031] The system may further include means for determining the calorie intake value of a meal to be consumed by reference to one or more records of a meal database and the weight or volume of the meal. Each record in the meal database may also include at least one nutritional detail from the following: protein, carbohydrate, fat, fibre.

[0032] The planning means may also operate to warn the user if one or more of the at least one nutritional detail does not equal the user's recommended daily intake value for that nutritional detail as adjusted for the duration of the specified time period. Alternatively, or in conjunction, the planning means may operate to suggest alternative and/or additional meals to the user where the specified set of meals do not meet the user's recommended daily intake value for that nutritional detail as adjusted for the duration of the specified time period.

[0033] It is expected that at least one record of the meal database will specify a food by reference to its calorie value on a per gram basis and the means for determining the calorie intake value of the meal is determined by multiplying the calorie value per gram of the food as recorded in the meal database by the weight of the meal. It is also expected that at least one record of the meal database will specify an ingredient by reference to its calorie value on a per gram basis and the means for determining

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the calorie intake value of the meal is determined at least in part by summing the total of the calculated calorie intake of each ingredient that forms the meal as determined by reference to the record of the ingredient as recorded in the meal database. The calculated calorie intake of each ingredient is ideally determined by multiplying the calorie value on a per gram basis of each ingredient forming part of the meal as recorded in the meal database by the weight of that ingredient as used in the preparation of the meal.

[0034] Similar expectations are made in respect of meals and/or ingredients that are determined by reference to volume (i.e. millilitres) rather than weight (i.e. grams).

[0035] The weight of each ingredient as used in the preparation of the meal may be determined by multiplying the weight of the meal as a whole by a percentage value representing the proportion of the meal formed from that ingredient.

[0036] The system may further include means for determining the portion size of a meal to be consumed required to equal a number of calories the user specifies they wish to consume. In this situation, at least one record of the meal database may specify a food by reference to its calorie value on a per gram basis and the means for determining the portion size of the meal is determined by dividing the number of calories the user specifies they wish to consume by the calorie value per gram of the food as recorded in the meal database. Alternatively, at least one record of the meal database may specify an ingredient by reference to its calorie value on a per gram basis and the means for determining the portion size of the meal is determined by for each ingredient:

> multiplying the number of calories the user specifies they wish to consume by a percentage value representing the proportion of the meal to be formed from that ingredient to determine an ingredient calorie target;

> dividing the ingredient calorie target by the calorie value per gram of the ingredient as recorded in the meal database.

[0037] Similar functionality is expected to be provided for in respect of meals and/or ingredients that are determined by reference to volume (i.e. millilitres).

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[0038] The means for determining the calorie value of a meal to be consumed by the user may adjust the calorie value of the meal according to the preparation method of the meal, if any.

[0039] The system may be integrated into a single device.

[0040] The system may further include count down means, the count down means operates to display to the user the time until the next meal should be consumed by the user. The user may also be displayed summary information regarding their calorie consumption. This summary information may include a calorie count value, the calorie count value being the value equal to the number of calories consumed by the user minus the number of calories burnt by the user.

[0041] The calorie count value may be compared to the recommended daily calorie intake value for the user and an approval indicator is displayed to the user based on the results of the comparison.

[0042] The user may operate to specify a set of meals to be consumed by reading the barcode of the meal to be consumed.

[0043] In accordance with a second aspect of the invention there is a method for planning calorie consumption comprising the steps of:

determining a recommended daily calorie intake value for a user;

determining the calorie value of a meal to be consumed by the user; and

determining the time at which the amount of calories in the meal consumed by the user will be expended with reference to the user's recommended daily calorie intake value.

[0044] The method may thereafter operate to achieve the same functionality as has been describe in the various variations of the first aspect of the invention.

[0045] In accordance with a third aspect of the invention there is a computer readable medium having software recorded thereon that, when executed on an appropriate processing device, performs the method according to the second aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

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[0046] The invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic representation of a first embodiment of the invention.

Figure 2 is a schematic representation of a second embodiment of the invention.

Figure 3 is a schematic representation of a third embodiment of the invention.

Figure 4 is a schematic representation of a fourth embodiment of the invention.

Figure 5 is a screenshot of a main interface screen of an App the subject of a fifth embodiment of the invention.

Figure 6 is a screenshot of a first secondary interface screen of the App shown in Figure 5.

Figure 7 is a screenshot of a second secondary interface screen of the App shown in Figure 5.

Figures 8 to 12 are flowcharts showing the operation of the invention in its various embodiments.

PREFERRED EMBODIMENTS OF THE INVENTION

[0047] Specific embodiments of the present invention are now described in detail. The terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention.

[0048] In accordance with a first embodiment of the invention there is a system for planning calorie consumption 10 comprising software 12 executable on a processing device 13. In this embodiment, the processing device is a standard computer system as would be known to the person skilled in the art. The software 12 is in data communication with the following databases:

- an RDI database 14;
- an exercise calibration database 16; and
- a nutritional database 18.

[0049] The processing underlying the software 12 will be explained in more detail below in the context of its intended use.

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[0050]A user (not shown) executes the software 12 which commences loading. Following loading of the software 12, the user has the option of either:

- calculating their daily recommended calorie intake;
- determining the calorie value of a meal to be consumed; OR
- determining an appropriate portion size of a meal to be consumed.

[0051]Each of these options will now be discussed in turn.

Calculating Daily Recommended Calorie Intakes

[0052]If the user selects this option, the user is asked to first provide details such as:

- their sex (ie. male or female);
- their age;
- their height; AND
- their weight.

[0053]Once the above details have been entered, the software 12 queries the RDI database 14. The RDI database 14 comprises a series of records that include the current calorie intake amounts recommended by health professionals for both males and females in various age ranges.

[0054]For instance, based on present recommended values, a male aged between 36 to 40 years of age has a recommended daily intake of 2,200 calories.

[0055]In this embodiment, the RDI database 14 comprises records representing the standard calorie intake model as created by Alan Borushek as published by Family Health Publications of Nedlands, Western Australia, Australia in the book titled "Alan Borushek's Calorie Fat and Carbohydrate Counter". The problem with this model, however, is that it only provides relevant values for people up to 90 kilograms in weight. Therefore, in order to correctly calculate for users above this weight, the software 12 must determine a standard calories per kilogram value ("**standard CPK value**")

[0056]Calculating the standard CPK value involves first identifying the recommended calorie intake for a person of the same age but of weight 90 kilograms. Once identified this value is then divided by 90 to arrive at the standard CPK value representative of the user's demographic. The standard CPK value is then multiplied

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by the user's weight to determine a sedentary individual recommended daily intake value for the user.

[0057] As each individual's daily calorie intake is affected by the level of exercise that they undertake, the sedentary individual recommended daily intake value is further corrected for the user's individual assessment of their level of exercise as chosen from a drop down list. In this embodiment, the drop down list contains three options (sedentary; moderate; and high).

[0058] If the user selects moderate or high from the drop down list, the software operates to query the exercise calibration database 16. The exercise calibration database 16 again comprises a series of records that include a calorie intake amount recommended by health professionals for both males and females in various age ranges. However, the exercise calibration database 16 is further divided by the level of exercise undertaken (i.e. moderate or high).

[0059] Following execution of this query, the software receives a recommended calorie exercise increment value.

[0060] If a recommended calorie exercise increment value is obtained, the software 12 further operates to divide this value by the recommended weight value as earlier identified to arrive at an enhanced calorie per kilogram value ("ECPK value"). The ECPK value is then multiplied by the user's weight to determine a calibrated recommended exercise increase value.

[0061] The calibrated recommended exercise increase value, if any, is then added to the sedentary individual recommended daily intake value to arrive at an exercise calibrated recommended daily calorie intake value for the user. A discretionary constant, under the Alan Buroshek model a value of 400 calories, is then applied to the exercise calibrated recommended daily calorie intake value for the user to arrive at a final recommended daily calorie intake value for the user. This discretionary constant is designed to accommodate for small changes that may arise in daily calorie requirements over time.

[0062] The data entered by the user, in addition to the calculated final recommended daily calorie intake value is then written to a file which forms the stored calorie profile 22 for the user.

Determining Calorie Value

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[0063] If the user chooses the option to determine the calorie value of a meal to be consumed the user is first requested to enter the weight of the meal they wish to consume.

[0064] After entering the weight of the meal to be consumed, the user is then asked to specify the meal. There are essentially two ways of doing this.

[0065] If the meal is a pre-prepared meal or other meal in which the nutritional information (including calories) is known, the user may choose the identifier associated with that pre-prepared meal or other meal from a drop-down list. To elaborate, the identifiers displayed to the user by way of the drop-down list are the unique identifiers of each record in the nutritional database 18.

[0066] In addition to this identifier, each record in the nutritional database 18 further includes the nutritional information for the meal associated with the identifier as determined on a per gram basis. While the amount of nutritional information to be included in each record need not be artificially limited, it must include the number of calories per gram of the meal concerned.

[0067] Where the user has chosen an identifier representative of a full meal, the software 12 presumes that this meal represents the totality of the meal and indicates this to the user. The user then has the option of changing this percentage to accord with a more accurate percentage reference. For example, if the user wishes to consume a pre-packaged lasagne as a main and a pre-packaged tomato soup as a starter, the user may allocate 75% as the proportion of the meal representing the lasagne and 25% as the proportion of the meal representing the tomato soup.

[0068] If the user has specified that this initial meal does not represent the full meal, then the user repeats the process described above until the proportional percentage value of all specified meals totals 100%.

[0069] Once the user has changed any allocated percentage as desired, the user presses the "Calculate" control button. Pressing this control button sees the software perform two actions:

- firstly, it determines the weight to be apportioned to each meal by multiplying the allocated percentage for that meal by the total weight value of the meal they wish to consume as entered by the user. This value is hereafter referred to as the meal's allocated weight and is determined in grams.

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- secondly, it determines the number of calories in each meal to be consumed. This is achieved by multiplying the meal's allocated weight (in grams) by the meal's calorie per gram information as recorded in its associated record in the nutritional database 18.

[0070] The user is then presented on the screen with the number of calories in each meal specified taking into account the allocated percentage of each meal relative to the other meals forming the meal. The user is also presented with a total calorie count for the meal as a whole.

[0071] Thus, if the user weighed the lasagne and pre-packaged soup at a total of 500gms as indicated in the above example, the software 12 would first calculate the weight as follows:

Lasagne = 75% x 500 grams = 375 grams

Tomato Soup = 25% x 500 grams = 125 grams.

[0072] Assuming that the lasagne has a recorded calorie per gram information in its associated record in the nutritional database 18 of 1.27 and that tomato soup has a recorded calorie per gram information in its associated record in the nutritional database 18 of 0.30, then the secondary calculations of the software 12 operate as follows:

Lasagne = 375 grams x 1.27cpg = 476 calories

Tomato Soup = 125 calories x 0.30cpg. = 38 calories

[0073] The user would then be presented with these two values (i.e. 476 calories of lasagne and 38 calories of tomato soup) on screen as well as the combined total meal calorie value of 514 calories.

[0074] In the event that the first meal selected by the user from the drop-down list does not represent a pre-prepared meal or other meal in which the nutritional information is known, the software operates to presume that the meal is an ingredient of the meal to be prepared and consumed.

[0075] Unlike where the user has chosen an identifier representative of a full meal, the software 12 makes no presumption regarding the percentage of the meal to be consumed this ingredient represents. Hence, the user must enter this percentage value at the position indicated before moving onto detailing the next ingredient. This

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continues until all ingredients that form part of the meal to be prepared have been detailed and appropriate percentage values allocated.

[0076] The user then presses the "Calculate" control button. Pressing this control button sees the software perform two actions:

- firstly, it determines the weight to be apportioned to each meal by multiplying the allocated percentage for that meal by the total weight value of the meal they wish to consume as entered by the user. This value is hereafter referred to as the meal's allocated weight and is determined in grams.

- secondly, it determines the number of calories in each meal to be consumed. This is achieved by multiplying the meal's allocated weight (in grams) by the meal's calorie per gram information as recorded in its associated record in the nutritional database 18.

[0077] The user is then presented on the screen with the number of calories present in each ingredient of their meal when taking into account the allocated percentage of each ingredient relative to the other ingredients forming the meal. The user is also presented with a total calorie count for the meal as a whole.

Determining Portion Size

[0078] If the user chooses the option to determine an appropriate portion size of a meal to be consumed the user is first requested to enter in the number of calories they wish to consume of the meal.

[0079] After entering the number of calories to be consumed, the user is then asked to specify the meal. There are essentially two ways of doing this.

[0080] If the meal is a pre-prepared meal or other meal in which the nutritional information (including calories) is known, the user may choose the identifier associated with that pre-prepared meal or other meal from a drop-down list. To elaborate, the identifiers displayed to the user by way of the drop-down list are the unique identifiers of each record in the nutritional database 18.

[0081] In addition to this identifier, each record in the nutritional database 18 further includes the nutritional information for the meal associated with the identifier as determined on a per gram basis. While the amount of nutritional information to be

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included in each record is limitless, it must include the number of calories per gram of the meal concerned.

[0082]Where the user has chosen an identifier representative of a full meal, the software 12 presumes that this meal represents the totality of the meal and indicates this to the user. The user then has the option of changing this percentage to accord with a more accurate percentage reference.

[0083]If the user has specified that this initial meal does not represent the full meal, then the user repeats the process described above until the proportional percentage value of all specified meals totals 100%.

[0084]Once the user has changed any allocated percentage as desired, the user presses the "Calculate" control button. Pressing this control button sees the software perform two actions:

- firstly, it determines the number of calories to be apportioned to each meal by multiplying the allocated percentage for that meal by the number of calories the user has indicated that they wish to consume of the meal. This value is hereafter referred to as the meal's allocated calorie portion.

- secondly, it determines the number of grams of each meal that needs to be consumed. This is achieved by dividing the meal's allocated calorie portion by the meal's calorie per gram information as recorded in its associated record in the nutritional database 18.

[0085]The user is then presented on the screen with the number of grams of each meal that needs to be prepared to meet their desired calorie intake for the meal when taking into account the allocated percentage of each meal relative to the other meals forming the meal.

[0086]Thus, continuing on using the example presented above, if the user wished to consume 500 calories from the meal of lasagne and pre-packaged soup, the software 12 would first calculate the number of calories as follows:

Lasagne = 75% x 500 calories = 375 calories

Tomato Soup = 25% x 500 calories = 125 calories.

[0087]Assuming that the lasagne has a recorded calorie per gram information in its associated record in the nutritional database 18 of 1.27 and that tomato soup has a

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recorded calorie per gram information in its associated record in the nutritional database 18 of 0.30, then the secondary calculations of the software 12 operate as follows:

Lasagne = 375 calories / 1.27cpg = 295 grams.

Tomato Soup = 125 calories / 0.30 = 417 grams.

[0088] The user would then be presented with these two values (i.e. 295 grams of lasagne and 417 grams of tomato soup) on screen.

[0089] In the event that the first meal selected by the user from the drop-down list does not represent a pre-prepared meal or other meal in which the nutritional information is known, the software operates to presume that the meal is an ingredient of the meal to be prepared and consumed.

[0090] Unlike where the user has chosen an identifier representative of a full meal, the software 12 makes no presumption regarding the percentage of the meal to be consumed this ingredient represents. Hence, the user must enter this percentage value at the position indicated before moving onto detailing the next ingredient. This continues until all ingredients that form part of the meal to be prepared have been detailed and appropriate percentage values allocated.

[0091] The user then presses the "Calculate" control button. Pressing this control button sees the software perform two actions:

- firstly, it determines the number of calories to be apportioned to each ingredient by multiplying the allocated percentage for that ingredient by the number of calories the user has indicated that they wish to consume of the meal. This value is hereafter referred to as the ingredient's allocated calorie portion.

- secondly, it determines the number of grams of each ingredient that needs to be incorporated into the meal. This is achieved by dividing the ingredient's allocated calorie portion by the ingredient's calorie per gram information as recorded in its associated record in the nutritional database 18.

[0092] The user is then presented on the screen with the number of grams of each ingredient that needs to be prepared to meet their desired calorie intake for the meal

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when taking into account the allocate percentage of each ingredient relative to the other ingredients forming the meal.

[0093] Regardless of whether the user chooses to determine the portion size or the calorie content of the meal to be consumed, following the appropriate calculation the software 12 operates to determine the time that the user should wait after consuming the meal before eating their next meal. This is determined by first determining a time vs calories ratio ("TVC ratio") for the user.

[0094] The TVC ratio for the user is determined by dividing the user's calculated recommended daily calorie intake value (as stored in their stored calorie profile 22) by 1,440. In this manner, the TVC ratio represents the average number of calories consumed per minute by the user.

[0095] The calorie value of the meal specified according to either of the aforementioned options is then divided by this TVC ratio to determine what is referred to in this embodiment as a TimeCal value. The TimeCal value then represents the length of time, in minutes, that the user should wait following consumption of the specified meal before eating a new meal. In this manner, the user is able to plan their calorie consumption for a day according to when the energy provided by calorie consumption will generally be required.

[0096] It should be appreciated by the person skilled in the art that under this arrangement, the user need only execute the option to calculate their daily recommended calorie intake once. Thereafter the remaining options available through the software 12 can operate with reference to the user's stored calorie profile. However, if the user's calorie profile changes (for instance, on the user engaging a personal trainer to help them keep fit or the user being injured in a manner that prevents vigorous exercise), the user may again execute this option to re-calibrate their daily recommended calorie intake.

[0097] In accordance with a second embodiment of the invention, where like numerals reference like parts, there is a system for planning calorie consumption 100. The system 100 comprises software 12 executable on a processing device 13. The software 12 is further operable to form a data and control communication link with a heart rate monitor 102.

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[0098] In this embodiment, the processing device is a standard computer system as would be known to the person skilled in the art, such as a notebook or desktop computer. The software 12 is in data communication with the following databases:

- an RDI database 14;
- an exercise calibration database 16; and
- a nutritional database 18;

[0099] The heart rate monitor 102 can take the form of any standard off-the-shelf unit, provided that it has a sample rate that would allow the system 100 to obtain a reasonable representation of the calories burnt by the user during a period of twenty four hours continuous wear. In this embodiment, the heart rate monitor 102 takes the form of a wristwatch which also maintains its standard watch functionality.

[0100] The processing underlying the software 12 and its interaction with the heart rate monitor 102 will be explained in more detail below in the context of its intended use.

[0101] A user (not shown) puts on the heart rate monitor 102 and wears the device for a period of at least twenty-four hours. During this twenty-four hour period, the user should undertake their normal daily activities.

[0102] Once the twenty-four hours, or such greater period, has elapsed, the user executes the software 12 which commences loading. Following loading of the software 12, the user has the option of either:

- calculating their daily recommended calorie intake;
- determining the calorie value of a meal to be consumed; OR
- determining an appropriate portion size of a meal to be consumed.

[0103] Each of these options will now be discussed in turn.

[0104] If the user chooses the option to calculate their daily recommended calorie intake, the software 12 sets up a data communication channel with the heart rate monitor 102. In this embodiment, the data communication channel takes the form of a wired USB cable connection between the processing device 13 and the heart rate monitor 102.

[0105] Following establishment of the data communication channel, the software 12 sends appropriate data requests to the heart rate monitor 102 for the number of minutes monitored and the number of calories consumed within that time period.

[0106] The number of calories consumed is then divided by the number of minutes monitored to obtain a TVC ratio value. The TVC ratio value is then multiplied by 1,440 to obtain what is in effect an averaged "real" daily calorie consumption value.

[0107] The averaged "real" daily calorie consumption value is then corrected for the inherent variance in the measurements of the heart rate monitor 102 as specified by the manufacturer. This corrected value then forms the user's recommended daily calorie intake for the purposes of the software 12.

[0108] The software 12 then operates further to collect other demographic information from the user as identified in the first embodiment of the invention. While this demographic information is not used for determining the user's recommended daily calorie consumption, it is relevant to determining the user's recommended daily intake of other nutritional factors such as those to be described below.

[0109] Following entry of this demographic information by the user, the corrected value representing the user's recommended daily calorie intake, as well as the demographic information provided, is written to a file which forms the stored calorie profile 22 for the user.

[0110] If the user chooses the option of either determining the calorie value of a meal to be consumed or determining an appropriate portion size of a meal to be consumed, then the software 12 proceeds in exactly the same manner as has been described in the first embodiment of the invention for the respective option. This includes the TimeCal calculation.

[0111] In accordance with a third embodiment of the invention, where like numerals reference like parts, there is a system for planning calorie consumption 200. The system 200 incorporates the functionality of the system 100 of the second embodiment of the invention, but also provides meal planner and monitoring functionality.

[0112] To facilitate this functionality, the software 12 is also in data communication with a meals database 20. The meals database 20 operates to record, on request of

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the user, details of any meals specified by the user using either the option of determining the calorie value of a meal to be consumed or the option of determining an appropriate portion size of a meal to be consumed.

[0113] Furthermore, in this embodiment, the user is asked as part of the demographic information to provide details of the number of hours they typically sleep per day. This entered value is then recorded in the stored calorie profile 22 as the hours asleep value.

[0114] At commencement of execution of the software 12, the user is presented with the additional option of creating a meal planner.

[0115] If the user chooses the option of creating a meal planner, the user is presented with a blank table. The blank table has a header row. In the table of this embodiment, the columns of the table are headed: Meal; Grams; Calories and TimeCal's respectively.

[0116] For the first row of the table following the header row, the user is locked from entering in information in any column other than the TimeCal's column. Furthermore, the user is directed to enter a time value in this first row of the TimeCal's column representative of the time the user generally wakes up in the morning.

[0117] Once the user has entered a value in the first row of the TimeCal's column, the user is free to populate the table.

[0118] In this embodiment, in order to properly populate the table, once a meal has been particularised using either the option to determine the calorie value of a meal to be consumed or the option to determine an appropriate portion size of a meal to be consumed, the user is asked to attribute a label of their choosing to the meal specified. The label, and the associated nutritional information for the particularised meal are then stored as a new record in a meal database 20.

[0119] Each record in the meal database 20, as identified by its label, is then able to be selected by a user via a drop-down list when they seek to enter a value in the "Meal" column of the table. Once so selected, the software 12 operates to pre-populate the remaining columns of the row with the stored nutritional information that forms part of the selected record.

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[0120]At the same time, the software 12 operates to reference the stored calorie profile 22 (assumed to be that of the user) as determined when the user selected the option of calculating their daily recommended calorie intake. A sleep calorie consumption rate and a waking hour calorie consumption rate is then determined with reference to measurements provided by the heart rate monitor 102 during identified sleep and waking times.

[0121]From the stored calorie profile 22, the software 12 also extracts the hours asleep value. The software 12 then determines the general time the user goes to sleep at night by subtracting the entered waking time (i.e. the time value entered in the first row of the TimeCals column) from the hours asleep value. This difference is then subtracted from midnight to determine the notional bed time of the user.

[0122]To elaborate by example, if the user has an hours asleep value of 6 hours and they have entered a time value in the first row of the TimeCals column of 0400, the difference between these values represents two hours. Subtracting two hours from midnight, means that the notional bed time of the user is 2200 hours.

[0123]The software 12 also operates to determine the time that should elapse before the user should consume their next meal. As this is the first meal of the day, the software first operates to factor in the calories that have been "consumed" that day during sleep. This factor is determined by taking the difference between the start of the day (i.e. 0000 hours) with the time value entered in the first row of the TimeCals column and multiplying this difference by the user's determined sleep calorie consumption rate.

[0124]Once determined, this factor value is subtracted from the calorie value of the meal to be consumed.

[0125]The remaining calorie value for the meal to be consumed is then divided by the user's determined waking calorie consumption rate. This result is then added to the time value entered in the first row of the TimeCals column to determine the time the next meal should be consumed.

[0126]For each meal to be consumed after the first, the calculation of the time for the next following meal is determined simply on the basis of dividing that meal's calorie

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value by the user's waking calorie consumption rate and adding that value to the time value of the meal to be consumed.

[0127] However, in order to ensure proper calorie consumption, once this time has been determined it is cross-referenced against the calculated time against the user's notional bed time. If the next meal is calculated to be within a time period past the user's notional bed time, the software 12 operates as follows.

[0128] The difference in time between when the next meal has been calculated as notionally to be consumed and the user's notional bed time is calculated. As this portion of the time calculation is in error (due to the wrong calorie consumption constant being used), the software then calculates the proper time for consuming the next meal by applying the following formula:

$$TTNM = ((NTTNM - BT) \times SCCR) / WCCR$$

where:

TTNMM = Time to Next Meal;

NTTM = Notional Time to Next Meal (i.e. the original calculated time to next meal);

BT = the user's notional bed time;

SCCR = Sleep calorie consumption rate; AND

WCCR = Waking calorie consumption rate.

[0129] As the user enters in each meal according to their label the software 12 calculates the sum total of the calorie values of each meal selected. If this sum total does not equal the calorie limit previously calculated, the software 12 operates to inform the user of this difference. If the difference is negative, indicating that the specified calorie intake is less than the calorie limit, the user is informed of the extent of the difference and warned that further meals should be consumed in order to meet the calorie limit or that existing meals should be modified to increase the amount of calories consumed.

[0130] If the difference is positive, indicating that the specified calorie intake is greater than the calorie limit, the user is informed of the extent of the difference and warned

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that one or more of the selected meals should be removed or changed in order to meet the calorie limit.

[0131]At a time after specifying at least two meals in the table, the user may select the action button marked "Synchronise". Pressing this action button results in the software 12 setting up a data communications channel with the heart rate monitor 102. The software 12 then uses this data communications channel to specify to the heart rate monitor 102 a series of alarms. These alarms are then incorporated and utilised by the general watch functionality of the heart rate monitor 102 to provide an alarm to the user when the next meal as specified using the meal planner should be consumed.

[0132]In accordance with a fourth embodiment of the invention, where like numerals reference like parts, there is a system for planning and monitoring calorie consumption 300. The system 300 incorporates the functionality of the system 200 of the third embodiment of the invention, but modified as to allow for real-time updating of the meal planner.

[0133]To elaborate, the user goes through the process described above to specify a meal plan for a first day. Unlike in the third embodiment, however, this first plan acts as the beginning of a rolling meal plan for the user. In doing so, the software 12 need not check whether the user has exceeded their daily intake and recommend adjustments to specified meals to meet this target amount – rather the software 12 merely calculates based on the excess calories consumed when during the next day the user should consume their next meal In this embodiment, the meal planner is not limited in time, but is displayed to the user on a weekly basis.

[0134]Once the user has specified their meal plan, before the user undertakes any form of exercise they manipulate the heart rate monitor to start a separate calorie and time recording session for the exercise period. Once the user has completed their exercise, they stop this recording session and note the number of calories consumed and the time spent exercising.

[0135]The user then accesses the meal planner and presses an exercise control button. On pressing the exercise control button, the user is prompted to enter in the number of calories consumed during exercise and the time spent exercising. Once

entered, the software 12 operates to assume that the exercise has just been completed. On the basis of this assumption, the software 12 then operates to recalculate the TimeCals between meal consumptions factoring in the calories already consumed during the exercise period.

[0136] At the same time, the software operates to update the user's daily recommended calorie intake for that day. However, to avoid double up based on normal calorie consumption during the exercise timeframe, the software 12 operates only to record an increase in daily recommended calorie consumption based on the following formula:

$$MDRCI = PDRCI + EECC - (TSE \times WCCR)$$

where:

MDRCI = Modified Daily Recommended Calorie Intake;

PDRCI = Previous Daily Recommended Calorie Intake;

EECC = Entered Exercise Calories Consumed;

TSE = Time Spent Exercising; and

WCCR = Waking calorie consumption rate

[0137] In accordance with a fifth embodiment of the invention, where like numerals reference like parts, there is a system for planning and monitoring calorie consumption 400. The system 400 takes the form of software commonly referred to as an "App" for execution on smart phone and/or tablet computers.

[0138] A screen shot of the main display of this App is shown at Figure 5.

[0139] On initial execution of the App, the user (not shown) is required to enter in demographic information from which their daily recommended calorie intake can be determined. This procedure is, in substance but not in form, the same as has been described for the first embodiment under the heading "Calculating Daily Recommended Calorie Intakes".

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[0140] Once this user's daily recommended calorie intake is determined, the user is then presented with interface screen 402. The interface screen 402 has the following elements:

- a countdown timer 404;
- an approval indicator 406;
- a calorie counter 408;
- an Add Calories control button 410;
- a Burn Calories control button 412;
- A date selector 414; and
- A summary table 416.

[0141] The summary table 416 provides summary details of the user's recommended daily calorie intake based on a user with the same demographic profile adopting a sedentary lifestyle, the number of calories consumed during the selected day, the number of calories burnt during the selected day and the calorie count for the selected day. Associated with the calorie count for the selected day is a visual indicator 418. At initialisation, the only non-zero value in the summary table 416 is the user's recommended daily calorie intake which takes the value calculated as described earlier.

[0142] If the user activates the Add Calories control button 410, the interface changes to display a meals list screen 420 as shown in Figure 6.

[0143] Each record on the meals list screen 420 provides the following information:

- a general description of the meal, be it food, beverage, or ingredient; AND
- a description of the amount of calories/kilojoules generated by consumption of that meal on a weight or volume basis (as appropriate). In this embodiment, the identified weight or volume used is a 100g/100ml basis so as to provide a more readily recognisable calorie/kilojoule value to the user.

[0144] The user can then navigate through the records on the meals list screen 420 through standard finger gestures and select a record accordingly.

[0145] Once a meal has been selected, the user is returned to the interface screen 402. This time around, the interface screen 402 is updated as follows:

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- Countdown timer 404 is incremented by the amount of time calculated under the principles disclosed in the first embodiment of the invention till the next meal should be consumed and with reference to the selected activity (if any). The countdown timer 404 is explained in more detail below.

- Calorie counter 408 is incremented by the number of calories in the meal chosen.

- Summary table 416 is modified such that the calories consumed field is incremented by the number of calories in the meal chosen and the calorie counter field is updated to equal the value of the calorie counter 408.

[0146]The countdown timer 404 commences at the amount of time needed to burn off the calories associated with the chosen meal. Thereafter, every second, the countdown timer 404 decrements by a second in line with signals generated by the internal real-time clock of the smart phone or tablet, as appropriate.

[0147]It should be noted that the countdown timer may show a negative value representing that it is past the time when the user should have consumed an additional meal.

[0148]At any point in time, the user may activate the Burn Calories control button 412, the interface changes to display an activities list screen 422 as shown in Figure 7.

[0149]Each record on the activities list screen 422 provides the following information:

- a general description of the activity; AND

- a description of the amount of calories burnt during an identified time period. In this embodiment, the identified time period is thirty minutes so as to provide a more readily recognisable calorie value to the user.

[0150]The user can then navigate through the records on the activities list screen 422 through standard finger gestures and select a record accordingly.

[0151]Once an activity has been selected, the user is again returned to the interface screen 402. As before, the interface screen 402 is updated as follows:

- the countdown timer 404 is updated to a new countdown time. The new countdown time represents the difference between the calories already

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consumed and the calories already burnt divided by the amount of calories to be burnt by the selected activity on a per minute basis.

- As each minute passes following selection of the activity record, the calorie counter 408 is decremented by the number of calories in the meal chosen.

- As each minute passes following selection of the activity record, the calories burnt field in the summary table 416 is incremented by the amount of calories to be burnt by the selected activity on a per minute basis.

- The calorie counter field in the summary table 416 is updated to equal the value of the calorie counter 408.

[0152] The countdown timer 404 then continues to tick down as previously described.

[0153] Again, at any point in time, the user may either change the activity currently being undertaken or indicate that a new meal has been consumed by activating the appropriate control button 410, 412.

[0154] Where the user activates control button 410, i.e. they indicate that a new meal has been consumed, the countdown timer 404 is incremented as discussed above.

[0155] As is evident from the above, the calorie counter 408, and hence the calorie counter field in the summary table 416, is the result of subtracting the calories burnt field value from the calories consumed field value. Furthermore, each time the calorie counter 408 is updated the updated value is checked against the calorie budget field of the summary table 316. If the comparison results in the updated value being lower than the value of the calorie budget field, the approval indicator is updated, or remains, showing an approval signal to the user. The approval signal demonstrates to the user that they are still acting in accordance with their calorie requirements.

[0156] If the comparison results in the updated value being in excess of the value of the calorie budget field, the approval indicator is updated, or remains, showing a disapproval signal to the user. The disapproval signal demonstrates to the user that they have exceeded their calorie requirements and should undertake further, or more strenuous, exercises.

[0157] Where the user activates control button 412, i.e. they indicate that a new activity is being undertaken, the App operates to update the countdown timer 404 in

line with the new selected activity's calorie burn rate. The incremental rate of the calories burnt field is similarly recalculated.

[0158] At any point in time, the user may manipulate the arrow buttons of the date selector 414 to arrive at a past desired date. When so manipulated the App operates to update all of the elements of the interface screen 402 to reflect the values recorded for the date selected.

[0159] The person skilled in the art should recognise that while reference is made within this specification to the term "meal", this is intended to be a reference to anything from a single piece of fruit through to a full 11 course degustation menu sitting. As such, no limitations should be read into the term other than it being a reference to food.

[0160] Similarly, the term meals should be read as a reference to beverages.

[0161] It should be appreciated by the person skilled in the art that the above invention is not limited to the embodiment described. In particular, the following modifications and improvements may be made without departing from the scope of the present invention:

- [0162] In one variant of the invention, where a meal to be consumed comprises multiple items that are to be made from individual ingredients (or where a meal is to be made from ingredients some of which are themselves to be made from yet further ingredients) the invention can be modified to allow a user to specify such ingredients in a multi-level format. The multi-level format may also allow the user to expand or collapse ingredients grouped at a certain level to improve the user's visibility of relevant or desired information.

- [0163] The user may be presented with the option of saving any specified meal by way of an associated identifier in the meal database 20 for later reference through the meal planner. This reference may be weight independent (in which case the information determined is stored on a per gram basis) or may be weight-specific (in which case the information is stored by reference to the weight indicated by the user).

- [0164] The user may be presented with the full nutritional information relating to each specified meal and/or the total meals as specified in the meal planner.

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Alternatively, the user may be presented with a subset of such nutritional information. In a preferred embodiment, the subset of nutritional information presented to the user refers only to the protein, carbohydrate, fat, fibre and calorie levels of the meal(s).

- [0165] When specifying a meal to be made from individual ingredients, the user may also be prompted to enter in details of the preparation method (ie. steaming, cooking, microwaving, etc.). In this manner, the calorie and/or nutritional information for the meal can be further calibrated to account for changes caused by the preparation method (if any).

- [0166] The system 10, 100, 200, 300, 400 may be modified to allow for multiple user profiles to be stored. To facilitate proper identification of the relevant profile, on loading of the software 12, the user may be asked to select the relevant profile or enter in an identifier by which the relevant profile can be identified (i.e. user name).

- [0167] While the invention as described in the second embodiment has been made with reference to a heart rate monitor 102, the invention can easily work with any other form of monitoring device from which a reliable calorie consumption value can be determined (whether directly or by processing of other variables which have been monitored). Furthermore, there is no reason why the heart rate monitor 102 may not be integrated with the processing device 13. As an example of how this could be achieved, the processing device may take the form of a smart phone having an adaptor that allows the smart phone to receive physiological data relating to the user in the same manner that the heart rate monitor 102 does.

- [0168] To facilitate data entry and avoid ambiguity, all time references in each of the embodiments should be twenty-four hour time references.

- [0169] The systems 10, 100, 200, 300, 400 may be further modified to allow for records regarding pre-prepared meals to be entered or updated as required. As most nutritional information for pre-prepared meals are detailed on a per 100gm basis, the systems 10, 100, 200, 300, 400 may also provide a 100gm to 1gm convertor for such nutritional information.

- [0170] Functionality may need to be built into the systems 10, 100, 200, 300, 400 to ensure that the drop down lists only show meal values most relevant to

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the user (for example, only those meals specified in the meal database 20). This may need to be achieved by way of expert determination, analysis of usage patterns, prioritising or simply deleting of unused records within the relevant databases.

- [0171] In a variation of the third embodiment, the user may also be presented with additional warnings regarding whether the meals as specified in the meal planner meet the recommended daily intakes of one or more of the additional nutritional information (e.g. if the user is under or over the recommended daily intake of fibre).

- [0172] The meal planner of the third embodiment may be modified such that the table is scaled to a time reference (for example, every row in the table representative of a half hour of "awake" time). In this arrangement, following calculation of the amount of time that should pass before the user consumes their next meal, the software 12 may operate to "block out" the equivalent amount of time within the table. Hence, the table begins to look more like a user's diary or calendar in that when planning their meals for the day they can visually appreciate when exactly each meal should be consumed.

- [0173] While the third embodiment of the invention shows the meal planner being required to take meal information as specified using other options of the software 12, there is no reason why this specification process cannot be integrated into the meal planner. For simple foods not normally considered a meal, such as a piece of fruit, this would then allow the user to specify the ingredient direct without needing to access other functionality within the software 12 before doing so.

- [0174] Where the meal planner determines that the total calories of meals specified by the user falls short of their limit value, the software 12 may operate to suggest meals to the user that will meet this shortfall.

- [0175] While the embodiments described above have been detailed with reference to databases, the invention can just as easily implemented by way of a spreadsheet program such as Microsoft Excel™.

- [0176] While the software 12 has been described in the context of an executable program to be executed on a processing device, the functionality of

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the software 12 may also be embodied and provided to users by way of a website

- [0177] In a preferred variation of the second embodiment, the user is required to wear the heart rate monitor 102 over a seven day period in order to determine an average daily calorie consumption. The use of the heart rate monitor 102 over such a period of time allows for variances in the user's daily routine to be smoothed out over the course of their general weekly routine. For example, a calibration done on a Monday when the user exercises will be skewed in favour of a higher daily calorie consumption. However, if that same user does not exercise on any other day of the week, this variation will be minimised in its averaging across the seven day cycle.

- [0178] In a further variation of the second embodiment as described in the preceding bullet point, the software 102 may operate to generate a stored calorie profile 22 for each day of the week for the user. In this manner, extending on from the example presented above, the user's stored calorie profile for Mondays – when they exercise – would have a higher recommended daily calorie intake value when compared to the stored calorie profiles for the remaining days of the week.

- [0179] The first embodiment may be modified to factor in the difference in calorie consumption during a user's waking hours and their sleeping hours. In doing so, it is envisaged that the first embodiment would use the same processing as described in the meal planner of the third embodiment of the invention for calculating the time until the user should consume their next meal.

- [0180] The first embodiment may be modified such that rather than applying a generalised value representative of the level of exercise undertaken by the user, the user may specify the actual calories they have consumed during an exercise period as well as the time spent exercising. However, to correct for double counting, if the user specifies the actual calories they have consumed during an exercise period, their daily recommended calorie intake value is modified as follows:

$$DRCI = oDRCI + EECC - (TSE \times WCCR)$$

where:

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DRCI = Daily Recommended Calorie Intake;

oDRCI = the Daily Recommended Calorie Intake as described in the first embodiment of the invention but excluding the calculations relating to adjustments for exercise levels;

EECC = Entered Exercise Calories Consumed;

TSE = Time Spent Exercising; and

WCCR = Waking calorie consumption rate]

- [0181] In the second embodiment, and other embodiments based on the second embodiment, the number of calories consumed by the user during the calibration period may be determined by the heart rate monitor 102 or other monitoring device. Alternatively, the number of calories consumed may be calculated by the software based on measurements supplied by the heart rate monitor 102 or other monitoring device.

- [0182] While the embodiments above have been described in the context of food being measured in grams, it is understood and recognised that for some food this is not an appropriate form of measurement. Examples include beverages which are typically described in millilitres. Furthermore, other foods may typically be described on a unit basis rather than by weight (eg. one dim sum or one cup or teaspoon). In both cases, the software 12 provides functionality for either converting these alternative measurement descriptors into an equivalent gram value or for specifying the equivalent weight value of each measurement descriptor for the type of food concerned. However, in the case of non-weight based measurements, because such quantifiers are open to variation and thus open to differences in calorie content between serves, it is far preferable for the invention to operate using exact quantifiers such as grams or millilitres.

- [0183] In a variation of the third embodiment, a first user may specify a meal plan according to their recommended daily calorie intake and then export the meal plan for use by other users. When another user imports the meal plan, the software 12 will check to see whether the user has an identical recommended daily calorie intake value to that of the user who prepared the

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meal plan. If not, the software 12 will execute an adjustment program. The adjustment program will work through the meal plan and recommend to the other user adjustments to portion sizes of each meal specified (wherever possible) so as to ensure that the other user has a meal plan of similar make-up and timing to that of the first user.

- [0184] In a variation of the configuration referenced in the preceding bullet point, the adjustment program may make automatic adjustments to the meal plan according to its programming rather than simply recommending to the other user adjustments in portion sizes.

- [0185] In a further variation of the configurations referenced in the preceding two bullet points, user's may be linked together by the software 12 such that meal plans created by any of the users (or a specifically authorised user) are replicated for each other linked user. Furthermore, in this arrangement, the software 12 may operate to allow the specifying or authorised user to print out a meal plan report. The meal plan report would include details of the aggregate portion sizes of each meal for each linked user, the individual portion sizes of each meal for each linked user and the time when each meal is to be consumed. In this manner, the meal plan report can provide the cook of a household with details of the total amount of a meal to be prepared for member of the household as well as how that meal is to be apportioned between members of the household.

- [0186] In variations of the invention, the software 12 may omit the choice of specifying a meal according to its calorie intake in favour of requesting details from the user as to the number of meals they wish to consume. In this variation, the software 12 will then divide the recommended daily calorie intake contained in the user's stored calorie profile 22 by the number of meals to be consumed to arrive at an averaged calorie value. The software 12 will then operate in the same manner as if the user had sought to specify a meal according to its calorie intake, excepting that the specified calorie intake value will be deemed to be the averaged calorie value.

- [0187] The data communication channel formed between a heart rate monitor 102, or other monitoring device, and processing device 13 may take forms other than the USB connection described above. For instance, other forms of

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wired connection may be used such as eSATA. Alternatively, the data communication channel may be a wireless communication channel established by way of Bluetooth™ or near-field communication modules.

- [0188] In a variation of the fourth embodiment, the rolling meal planner may be limited in time. For example, the meal planner may be limited to specifying meal for a week or a month. Where the meal planner is so limited, the software 12 will operate to check that the daily recommended calorie consumption for the user, as aggregated over that time frame, has not been exceeded. If it has, then the software 12 operates to suggest modifications to, or deletions of, meals so as to ensure that the user remains within their target amounts using processing similar to that described in the third embodiment.

- [0189] In a variation of the first embodiment, other calorie intake models may be used as a replacement for the Alan Borushek model. Where these models have greater range and, optionally, granularity in determining recommended daily calorie intakes for people based on weight, the need to determine CPK values for people outside of these ranges may be omitted.

- [0190] In a further variation of the first embodiment, the user may be asked to particularise the level of exercise and time spent exercising. For instance, the user may be asked how much time is spent doing light exercise, how much time spent doing moderate exercise and how much time is spent doing heavy exercise. These values can then be factored in to determine more accurately their daily recommended calorie intake.

- [0191] Due to the greater particularisation of data of relevance to the user using the first embodiment of the invention, the variance value introduced by the Alan Borushek model may be omitted or varied beyond the recommended 400 calories.

- [0192] In a variation on the third embodiment, the user may configure the software so that suggestions regarding changes to specified meals to meet the recommended daily calorie intake of the user can be turned off.

- [0193] In a variation of the third embodiment, the software 12 may determine the user's sleep calorie consumption rate in a number of manners. For instance, the sleep calorie consumption rate may be a general constant value determined by reference to the user's demographical profile.

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- **[0194]** In a further variation of the third embodiment, the software 12 need not synchronise with the heart rate monitor 102 to provide alarms.

- **[0195]** In a variation of the fourth embodiment of the invention, the user may configure the software so that suggestions regarding changes to specified meals to meet recommended daily calorie intake of the user can still be made even in the rolling meal planner format.

- **[0196]** In a variation of the fourth embodiment of the invention, the system 300 may allow for continuous calorie monitoring of the user. At predetermined time intervals, for example, every fifteen minutes, the software 12 may query the heart rate monitor 102, or like calorie monitoring device, to determine how many calories have been burnt in the preceding fifteen minutes. This value can then be cross-referenced against the user's anticipated calorie consumption for that period. If the two values differ, adjustments may then be made to the TimeCal calculation in order to more properly reflect when the user should consume their next meal.

- **[0197]** Where values are determined on an average basis, the averaging calculation may be weighted where circumstances warrant it in order to more properly reflect the user's activity profile or demographics.

- **[0198]** In a further variation of the third embodiment and fourth embodiment, the software 12 may analyse the data provided by the heart rate monitor 102 to determine the time the user is asleep. In such a configuration, this omits the need for the user to specify the time they spend asleep. Furthermore, in this configuration, the amount of calories burnt by the user during sleep may · also be automatically determined and used as the basis for the user's sleep calorie consumption rate.

- **[0199]** For those embodiments of the invention designed to prevent the editing of calorie and other nutritional data relating to a specified time period (e.g. a day). This "locking" of information may occur at a specific time, for example, at midnight all such information entered for the preceding twenty four hours becomes locked.

- **[0200]** To account for users whose aim in monitoring and planning their calorie consumption is to lose weight, provision should be made for a user to update their body weight. This can be of particular importance as, as has been

indicated above, a person's recommended calorie intake is partly dependent on their weight.

- [0201] As an extension of this functionality, the user may be able to set a goal weight and the time by which to achieve this goal weight. When set, the invention will factor in the expected variance in weight into the user's calorie profile as time progresses. Furthermore, the system may operate to assess whether the goal weight is achievable by the specified time in accordance with what is considered current best practice for weight loss. If the assessment determines that the goal weight is not achievable in accordance with this practice, the user will still be permitted to specify such a goal weight and date for achieving said goal weight, but with the system operating to warn the user that this is not a recommended course of action.

- [0202] The invention may be further modified to allow a user to track one or more body measurements. Such body measurements contemplated by the user include biceps, waist, calves, etc.

- [0203] The system may be operable to provide historical graphs or charts of one or more tracked characteristic. For instance, in the invention as described, this includes the characteristics weight, calories consumed, carbohydrates consumed, protein consumed and one or more of the body measurements. In the preferred embodiment, the historical graphs are able to provide data on the characteristic for up to a three (3) year period.

- [0204] In a variation on the fourth embodiment, the activity and meal data may be obtained from external sources. For instance, a centralised activity and meal database may be hosted on the internet and the system accesses those databases via the internet to obtain the necessary or desired records.

- [0205] When determining when to use the waking calorie consumption rate and when to use the sleeping calorie consumption rate, the system may operate to factor a preset buffer time to one or both sides of any time period the user has indicated they would be asleep. This buffer time represents the common practice that a user needs to relax before sleeping and is not in a position to eat immediately on waking.

- [0206] Rather than requiring a user to specify the meal to be consumed, where the meal relates to one or more packaged product, specification of the meal to

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be consumed may be achieved by reading the barcode of the product. This of course requires the system to incorporate some device capable of reading barcodes.

- [0207] The alarm provided to the user when a meal is to be consumed may be an audio, visual or tactile alarm or any combination of the foregoing.

- [0208] While the invention has been described in the context of time being calculated in minute intervals, the invention can equally function where time is calculated in other intervals, such as half minute or second intervals.

[0209] It should be further appreciated that even more embodiments of the invention incorporating one or more of the aforementioned features, where such features are not mutually exclusive, can be created without departing from the invention's scope.

We Claim:

1. A system for planning calorie consumption comprising:

   means for determining a recommended daily calorie intake value for a user; and

   means for determining the calorie value of a meal to be consumed by the user; and

   means for determining the time at which the amount of calories in the meal consumed by the user will be expended with reference to the user's recommended daily calorie intake value.

2. A system for planning calorie consumption according to claim 1, where the system further comprises means for determining a set of demographic information regarding a user and the means for determining a recommended daily calorie intake value for the user does so based on the set of demographic information.

3. A system for planning calorie consumption according to claim 2, where the set of demographic information includes at least one of the following: sex; age; weight; height.

4. A system for planning calorie consumption according to claim 2 or claim 3, where the recommended daily calorie intake value for the user is determined by multiplying the weight of the user by a standard calorie per kilogram value calculated with reference to the remainder of the user's demographic information.

5. A system for planning calorie consumption according to any preceding claim, where the recommended daily calorie intake value for the user is also determined based on a generalised level of the user's physical activity undertaken.

6. A system for planning calorie consumption according to any preceding claim, where the recommended daily calorie intake value includes a discretionary constant to account for small changes in daily calorie requirements over time.

7. A system for planning calorie consumption according to any preceding claim, where the means for determining a recommended daily calorie intake value for a

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user differentiates between the recommended daily calorie intake value for the user according to the day of the week.

8. A system for planning calorie consumption according to any preceding claim, where the means for determining the time at which the amount of calories currently consumed by the user calculates a ratio value (**the TVC ratio**) representing the user's recommended daily calorie intake as determined on a per minute basis, and the time needed to expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

9. A system for planning calorie consumption according to any preceding claim, where the means for determining a recommended daily calorie intake value for the user includes a heart rate monitor, the recommended daily calorie intake value for the user being determined by reference to measurements taken by the heart rate monitor.

10. A system for planning calorie consumption according to claim 9, where the recommended daily calorie intake value for the user is determined by reference to measurements taken by the heart rate monitor over a twenty-four hour period.

11. A system for planning calorie consumption according to claims 9 or claim 10, where the means for determining a recommended daily calorie intake value for the user calculates a ratio value (**the TVC ratio**) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, and multiplying the TVC ratio by 1,440 to determine the recommended daily calorie intake value for the user.

12. A system for planning calorie consumption according to any one of claims 9 to claim 11, where the means for determining the time at which the amount of calories currently consumed by the user calculates a ratio value (**the TVC ratio**) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, where the time needed to

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expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

13. A system for planning calorie consumption according to any preceding claim where the means for determining the time at which the amount of calories consumed by the user will be expended is made with reference to a set of calorie ⌀ consumption values.

14. A system for planning calorie consumption according to claim 13, where the set of calorie consumption values is determined by, or derived from, measurements taken by a calorie monitoring device.

15. A system for planning calorie consumption according to claim 14, where the calorie monitoring device is a heart rate monitor.

16. A system for planning calorie consumption according to any preceding claim, further comprising a planning means, the planning means operable to allow the user to specify a set of meals to be consumed over a specified time period and, following specification, to determine the specific instances of time during that time period when each meal in the set of meals should be consumed.

17. A system for planning calorie consumption according to claim 16, where the user specifies at least one time period within the specified time period when the user will be asleep.

18. A system for planning calorie consumption according to claim 17, where the planning means operates to determine a sleep calorie consumption rate and a waking calorie consumption rate for the user, the planning means thereafter operable to determine the time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

the sum of all calories already expended up to the time the last meal was consumed; and

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for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

>   if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR
>
>   otherwise, the waking calorie consumption rate,

this time being the time at which the next meal in the set of meals should be consumed.

19. A system for planning calorie consumption according to claim 18, where the planning means operates to determine a sleep calorie consumption rate and a waking calorie consumption rate based on measurements provided by a heart rate monitor.

20. A system for planning calorie consumption according to claim 16 or claim 17, where the time period when the user should consume their next meal is determined according to the following formula:

$$TTNM = ((NTTNM - BT) \times SCCR) / WCCR$$

where:

>   TTNMM = Time to Next Meal;
>
>   NTTM = an original calculated time to next meal as determined by reference to a flat per minute calorie expenditure rate;
>
>   BT = a user's notional bed time;
>
>   SCCR = a sleep calorie consumption rate; AND
>
>   WCCR = a waking calorie consumption rate.

21. A system for planning calorie consumption according to any one of claims 1 to 15, further comprising a planning means, the planning means operable to allow the user to specify a set of meals to be consumed over a specified time period and the specific instances in times within the time period when each meal in the set of meals is to be consumed, where as each meal in the set of meals is specified, the

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planning means further operates to suggest a time when that meal should be consumed with reference to the sum total of calories already specified in the set of meals to be consumed

22. A system for planning calorie consumption according to claim 21, where the user specifies at least one time period within the specified time period when the user will be asleep.

23. A system for planning calorie consumption according to claim 22, where the planning means operates to determine a sleep calorie consumption rate and a waking calorie consumption rate for the user, the planning means thereafter operable to determine the suggested time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

the sum of all calories already expended up to the time the last meal was consumed; and

for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR

otherwise, the waking calorie consumption rate,

this time being the time at which the next meal in the set of meals should be consumed.

24. A system for planning calorie consumption according to any one of claims 16 to 23, where the planning means operates to issue an alarm to the user at each specific instance in time when a meal in the set of meals is to be consumed.

25. A system for planning calorie consumption according to any one of claims 16 to 24, where the planning means warns the user if the total calories to be consumed by the user through each meal in the set of meals does not equal the user's

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recommended daily calorie intake value as adjusted for the duration of the specified time period.

26. A system for planning calorie consumption according to any one of claims 16 to 25, where the set of meals to be consumed can be updated on a real-time basis, the planning means thereafter operable to recalculate or re-suggest, as appropriate, the time when the next meal in the set of meals should be consumed.

27. A system for planning calorie consumption according to any one of claims 16 to 26, where the planning means operates to suggest alternative and/or additional meals to the user where the specified set of meals do not met the user's recommended daily calorie intake value as adjusted for the duration of the specified time period.

28. A system for planning calorie consumption according to any one of claims 16 to 27, where the specified time period is twenty four hours.

29. A system for planning calorie consumption according to any one of claims 16 to 28, where the planning means is operable to plan meals over a set of specified time periods, and where the excess or deficit of calories consumed relative to the user's recommended daily calorie intake value for a specified time period is carried over to the next successive time period in the set of specified time periods.

30. A system for planning calorie consumption according to claim 29, where the times and dates at which each meal in the set of meals to be consumed should be consumed is shown to the user in a calendar format.

31. A system for planning calorie consumption according to claim 29 or claim 30, where the planning means is operable to import a set of specified meals along with recommended calorie intake value for the user who created the set of specified meals, the planning means thereafter operable to adjust the portion size of one or more of the set of specified meals in accordance with the variation in recommended calorie intake values for the user and the user who created the set of specified meals.

32. A system for planning calorie consumption according to any preceding claim, where the system further includes means for specifying a set of activities and where the means for determining the time at which the amount of calories

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currently consumed by the user will be expended is made with additional reference to the set of activities.

33. A system for planning calorie consumption according to claim 32, where the means for specifying the set of activities allows the user to specify a set of planned activities by reference to one or more records of an activity database.

34. A system for planning calorie consumption according to any preceding claims, where the means for determining a recommended daily calorie intake value for a user is determined according to the following formula:

$$MDRCI = PDRCI + EECC - (TSE \times WCCR)$$

where:

MDRCI = a modified daily recommended calorie intake;

PDRCI = a daily recommended calorie intake for a person of similar demographics to the user not engaged in exercise;

EECC = an amount of calories consumed through exercise;

TSE = an amount of time, as a decimal figure, representing the time spent exercising; and

WCCR = a waking calorie consumption rate

35. A system for planning calorie consumption according to any preceding claim, further comprising means for determining the calorie intake value of a meal to be consumed by reference to one or more records of a meal database and the weight or volume of the meal.

36. A system for planning calorie consumption according to claim 35, where each record in the meal database also includes at least one nutritional detail from the following: protein, carbohydrate, fat, fibre.

37. A system for planning calorie consumption according to claim 36, as dependent on any one of claims 15 to 28, where the planning means warns the user if one or more of the at least one nutritional detail does not equal the user's recommended

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daily intake value for that nutritional detail as adjusted for the duration of the specified time period.

38. A system for planning calorie consumption according to claim 36 or claim 37, as dependent on anyone of claims 16 to 31, where the planning means operates to suggest alternative and/or additional meals to the user where the specified set of meals do not meet the user's recommended daily intake value for that nutritional detail as adjusted for the duration of the specified time period.

39. A system for planning calorie consumption according to any one of claims 35 to 38, where at least one record of the meal database specifies a food by reference to its calorie value on a per gram basis and the means for determining the calorie intake value of the meal is determined by multiplying the calorie value per gram of the food as recorded in the meal database by the weight of the meal.

40. A system for planning calorie consumption according to any one of claims 35 to 38, where at least one record of the meal database specifies an ingredient by reference to its calorie value on a per gram basis and the means for determining the calorie intake value of the meal is determined at least in part by summing the total of the calculated calorie intake of each ingredient that forms the meal as determined by reference to the record of the ingredient as recorded in the meal database.

41. A system for planning calorie consumption according to claim 40, where the calculated calorie intake of each ingredient is determined by multiplying the calorie value on a per gram basis of each ingredient forming part of the meal as recorded in the meal database by the weight of that ingredient as used in the preparation of the meal.

42. A system for planning calorie consumption according to claim 40 or claim 41, where the weight of each ingredient as used in the preparation of the meal is determined by multiplying the weight of the meal as a whole by a percentage value representing the proportion of the meal formed from that ingredient.

43. A system for planning calorie consumption according to any one of claims 35 to 38, where at least one record of the meal database specifies a beverage by reference to its calorie value on a per millilitre basis and the means for

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determining the calorie intake value of the meal is determined by multiplying the calorie value per millilitre of the beverage as recorded in the meal database by the volume of the ingredient as used in the preparation of the meal.

44. A system for planning calorie consumption according to claim 43, where the volume of each ingredient as used in the preparation of the meal is determined by multiplying the volume of the meal as a whole by a percentage value representing the proportion of the meal formed from that ingredient.

45. A system for planning calorie consumption according to claim 43 or claim 44, where at least one record of the meal database specifies an ingredient by reference to its calorie value on a per millilitre basis and the means for determining the calorie intake value of the meal is determined at least in part by summing the total of the calculated calorie intake of each ingredient that forms the meal as determined by reference to the record of the ingredient as recorded in the meal database.

46. A system for planning calorie consumption according to claim 45, where the calculated calorie intake of each ingredient is determined by multiplying the calorie value on a per millilitre basis of each ingredient forming part of the meal as recorded in the meal database by the volume of that ingredient as used in the preparation of the meal.

47. A system for planning calorie consumption according to any preceding claim, further comprising means for determining the portion size of a meal to be consumed required to equal a number of calories the user specifies they wish to consume.

48. A system for planning calorie consumption according to claim 47, where at least one record of the meal database specifies a food by reference to its calorie value on a per gram basis and the means for determining the portion size of the meal is determined by dividing the number of calories the user specifies they wish to consume by the calorie value per gram of the food as recorded in the meal database.

49. A system for planning calorie consumption according to claim 47, where at least one record of the meal database specifies an ingredient by reference to its calorie

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value on a per gram basis and the means for determining the portion size of the meal is determined by for each ingredient:

multiplying the number of calories the user specifies they wish to consume by a percentage value representing the proportion of the meal to be formed from that ingredient to determine an ingredient calorie target;

dividing the ingredient calorie target by the calorie value per gram of the ingredient as recorded in the meal database.

50. A system for planning calorie consumption according to claim 47, where at least one record of the meal database specifies an ingredient by reference to its calorie value on a per millilitre basis and the means for determining the portion size of the meal is determined by for each ingredient:

multiplying the number of calories the user specifies they wish to consume by a percentage value representing the proportion of the meal to be formed from that ingredient to determine an ingredient calorie target;

dividing the ingredient calorie target by the calorie value per millilitre of the ingredient as recorded in the meal database.

51. A system for planning calorie consumption according to any preceding claim, where the means for determining the calorie value of a meal to be consumed by the user adjusts the calorie value of the meal according to the preparation method of the meal, if any.

52. A system for planning calorie consumption according to any preceding claim, where the system is integrated into a single device.

53. A system for planning calorie consumption according to any preceding claim, further including count down means, the count down means operates to display to the user the time until the next meal should be consumed by the user.

54. A system for planning calorie consumption according to any preceding claim, where the user is displayed summary information regarding their calorie consumption.

55. A system for planning calorie consumption according to claim 54, where the summary information includes a calorie count value, the calorie count value being the value equal to the number of calories consumed by the user minus the number of calories burnt by the user.

56. A system for planning calorie consumption according to claim 55, where the calorie count value is compared to the recommended daily calorie intake value for the user and an approval indicator is displayed to the user based on the results of the comparison.

57. A system for planning calorie consumption according to any preceding claim, where the user is operable to specify a set of meals to be consumed by reading the barcode of the meal to be consumed.

58. A method for planning calorie consumption comprising the steps of:

determining a recommended daily calorie intake value for a user;

determining the calorie value of a meal to be consumed by the user; and

determining the time at which the amount of calories in the meal consumed by the user will be expended with reference to the user's recommended daily calorie intake value.

59. A method for planning calorie consumption according to claim 58, the method further comprising the step of determining a set of demographic information regarding the user and the step of determining a recommended daily calorie intake value for the user does so based on the set of demographic information.

60. A method for planning calorie consumption according to claim 59, where the step of determining a recommended daily calorie intake value for the user is determined by multiplying the weight of the user by a standard calorie per kilogram value calculated with reference to the remainder of the user's demographic information.

61. A method for planning calorie consumption according to any one of claims 58 to 60, where the step of determining the recommended daily calorie intake value for a user is also determined based on a generalised level of the user's physical activity undertaken.

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62. A method for planning calorie consumption according to any one of claims 58 to 61, where the step of determining the recommended daily calorie intake value for a user factors in a discretionary constant to account for small changes in daily calorie requirements over time.

63. A method for planning calorie consumption according to any one of claims 58 to 62, further comprising the step of determining at least one additional recommended daily calorie intake value for a user.

64. A method for planning calorie consumption according to any one of claims 58 to 63, further comprising the step of determining the time at which the amount of calories currently consumed by the user calculates a ratio value (the TVC ratio) representing the user's recommended daily calorie intake as determined on a per minute basis, and the step of determining the time needed to expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

65. A method for planning calorie consumption according to any one of claims 58 to 64, where the step of determining a recommended daily calorie intake value for the user includes the substep of obtaining measurements from a heart rate monitor from which a calorie intake value can be calculated.

66. A method for planning calorie consumption according to claim 65, further comprising the step of calculating a ratio value (the TVC ratio) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, and multiplying the TVC ratio by 1,440.

67. A method for planning calorie consumption according to claim 65 or claim 66, further comprising the step of calculating a ratio value (the TVC ratio) by taking the number of calories consumed by the user as determined by the measurements taken by the heart rate monitor and dividing that value by the time period, in minutes, over which the measurements used to determine the number of calories consumed by the user has been taken, and where the step of determining the time needed to expend the number of calories consumed is determined by dividing the number of calories consumed by the TVC ratio.

68. A method for planning calorie consumption according to any one of claims 58 to 67, where the step of determining the time at which the amount of calories consumed by the user will be expended is made with reference to a set of calorie consumption values.

69. A method for planning calorie consumption according to claim 68, further comprising the substep of determining, or deriving, a set of calorie consumption values from measurements taken by a calorie monitoring device.

70. A method for planning calorie consumption according to any one of claims 58 to 68, further comprising the steps of specifying a set of meals to be consumed over a specified time period and, following specification, determining the specific instances of time during that time period when each meal in the set of meals should be consumed.

71. A method for planning calorie consumption according to claim 70, further comprising the step of specifying at least one time period within the specified time period when the user will be asleep.

72. A method for planning calorie consumption according to claim 71, further comprising the steps of:

   determining a sleep calorie consumption rate for the user;

   determining a waking calorie consumption rate for the user; and

   the step of determining the time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

   the sum of all calories already expended up to the time the last meal was consumed; and

   for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

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if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR

otherwise, the waking calorie consumption rate,

this time being the time at which the next meal in the set of meals should be consumed.

73. A method of planning calorie consumption according to claim 72, where the steps of determining a sleep calorie consumption rate and the step of determining a waking calorie consumption rate are each determined based on measurements provided by a heart rate monitor.

74. A method of planning calorie consumption according to any one of claims 58 to 71, further comprising the steps of:

specifying a set of meals to be consumed over a specified time period,

following specification, determining the specific instances of time during that time period when each meal in the set of meals should be consumed; and

as each meal in the set of meals is specified, the planning means further operates to suggest a time when that meal should be consumed with reference to the sum total of calories already specified in the set of meals to be consumed

75. A method of planning calorie consumption according to claim 74, as dependent on claim 70, further comprising the steps of:

determining a sleep calorie consumption rate;

determining a waking calorie consumption rate;

and where the step of determining the suggested time when each meal in the set of meals is to be consumed by determining for each minute subsequent to consumption of the previous meal, subtracting from the total of calories consumed from all previous meals within the time period:

the sum of all calories already expended up to the time the last meal was consumed; and

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for each minute subsequent to the time the last meal was consumed and until such time as the calories to be consumed by the meal is less than or equal to zero, either:

> if the minute falls within a specified time period when the user is asleep, the sleep calorie consumption rate; OR
>
> otherwise, the waking calorie consumption rate,

76. A method of planning calorie consumption according to any one of claims 58 to 75, further comprising the step of issuing an alarm to the user at each specific instance in time when a meal in the set of meals is to be consumed.

77. A method of planning calorie consumption according to any one of claims 58 to 76, further comprising the step of warning the user if the total calories to be consumed by the user through each meal in the set of meals does not equal the user's recommended daily calorie intake value as adjusted for the duration of the specified time period.

78. A method of planning calorie consumption according to any one of claims 58 to 77, further comprising the step of recalculating or re-suggesting, as appropriate, the time when the next meal in the set of meals should be consumed on a real-time basis.

79. A method of planning calorie consumption according to any one of claims 58 to 78, further comprising the step of suggesting alternative and/or additional meals to the user where the specified set of meals do not met the user's recommended daily calorie intake value as adjusted for the duration of the specified time period.

80. A method for planning calorie consumption according to any one of claims 58 to 79, further comprising the step of planning meals over a set of specified time periods, and the step of carrying over the excess or deficit of calories consumed relative to the user's recommended daily calorie intake value for a specified time period to the next successive time period in the set of specified time periods.

81. A method for planning calorie consumption according to claim 80, further comprising the step of showing to the user the times and dates at which each meal in the set of meals to be consumed in a calendar format.

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82. A method for planning calorie consumption according to claim 80 or claim 81, further comprising the steps of:

    importing a set of specified meals along with recommended calorie intake value for the user who created the set of specified meals; and

    adjusting the portion size of one or more of the set of specified meals in accordance with the variation in recommended calorie intake values for the user and the user who created the set of specified meals.

83. A method for planning calorie consumption according to any one of claims 58 to 82, further comprising the step of specifying a set of activities and where the step of determining the time at which the amount of calories currently consumed by the user will be expended is made with additional reference to the set of activities.

84. A method for planning calorie consumption according to claim 83, further comprising the substep of specifying a set of planned activities by reference to one or more records of an activity database.

85. A method for planning calorie consumption according to any one of claims 58 to 84, further comprising the step of determining the calorie intake value of a meal to be consumed by reference to one or more records of a meal database and the weight or volume of the meal.

86. A method for planning calorie consumption according to claim 85, further comprising the step of waning the user if one or more of the at least one nutritional detail does not equal the user's recommended daily intake value for that nutritional detail as adjusted for the duration of the specified time period.

87. A method for planning calorie consumption according to claim 85 or claim 86, further comprising the step of suggesting alternative and/or additional meals to the user where the specified set of meals do not meet the user's recommended daily intake value for that nutritional detail as adjusted for the duration of the specified time period.

88. A method for planning calorie consumption according to any one of claims 85 to 87 further comprising the step of determining the calorie intake value of the meal

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by multiplying a calorie value per gram of the food as recorded in the meal database by the weight of the meal.

89. A method for planning calorie consumption according to any one of claims 85 to 88, further comprising the step of determining the calorie intake value of the meal is determined at least in part by summing the total of the calculated calorie intake of each ingredient that forms the meal as determined by reference to the record of the ingredient as recorded in the meal database.

90. A method for planning calorie consumption according to claim 89, further comprising the step of determining the calorie intake of each ingredient by multiplying the calorie value on a per gram basis of each ingredient forming part of the meal as recorded in the meal database by the weight of that ingredient as used in the preparation of the meal.

91. A method for planning calorie consumption according to claim 89 or claim 90, further comprising the step of determining the weight of each ingredient as used in the preparation of the meal by multiplying the weight of the meal as a whole by a percentage value representing the proportion of the meal formed from that ingredient.

92. A method for planning calorie consumption according to any one of claims 89 to 91, where the step of determining the calorie intake value of the meal is determined by multiplying the calorie value per millilitre of the beverage as recorded in the meal database by the volume of the ingredient as used in the preparation of the meal.

93. A method for planning calorie consumption according to claim 92, further comprising the step of determining the volume volume of each ingredient as used in the preparation of the meal by multiplying the volume of the meal as a whole by a percentage value representing the proportion of the meal formed from that ingredient.

94. A method for planning calorie consumption according to claim 92 or claim 93, where the step of determining the calorie intake value of the meal is determined at least in part by summing the total of the calculated calorie intake of each

ingredient that forms the meal as determined by reference to the record of the ingredient as recorded in the meal database.

95. A method for planning calorie consumption according to claim 94, where the step of calculating the calorie intake of each ingredient is determined by multiplying the calorie value on a per millilitre basis of each ingredient forming part of the meal as recorded in the meal database by the volume of that ingredient as used in the preparation of the meal.

96. A method for planning calorie consumption according to any one of claims 58 to 95, further comprising the step of determining the portion size of a meal to be consumed required to equal a number of calories the user specifies they wish to consume.

97. A method for planning calorie consumption according to claim 96, where the step of determining the portion size of the meal is determined by dividing the number of calories the user specifies they wish to consume by the calorie value per gram of the food as recorded in the meal database.

98. A method for planning calorie consumption according to claim 97, where the step of determining the portion size of the meal is determined by, for each ingredient:

multiplying the number of calories the user specifies they wish to consume by a percentage value representing the proportion of the meal to be formed from that ingredient to determine an ingredient calorie target;

dividing the ingredient calorie target by the calorie value per gram of the ingredient as recorded in the meal database.

99. A method for planning calorie consumption according to claim 98, where the step of determining the portion size of the meal is determined by, for each ingredient:

multiplying the number of calories the user specifies they wish to consume by a percentage value representing the proportion of the meal to be formed from that ingredient to determine an ingredient calorie target;

dividing the ingredient calorie target by the calorie value per millilitre of the ingredient as recorded in the meal database.

100. A method for planning calorie consumption according to any one of claims 58 to 99, where the step of determining the calorie value of a meal to be consumed by the user adjusts the calorie value of the meal according to the preparation method of the meal, if any.

101. A method for planning calorie consumption according to any one of claims 58 to 100, further comprising the steps of counting down the time until the next meal should be consumed by the user and displaying this count down time to the user.

102. A method for planning calorie consumption according to any one of claims 58 to 101, further comprising the step of displaying to the user summary information regarding their calorie consumption.

103. A method for planning calorie consumption according to any one of claims 58 to 102, further comprising the step of displaying to the user a calorie count value, the calorie count value being the value equal to the number of calories consumed by the user minus the number of calories burnt by the user.

104. A method for planning calorie consumption according to claim 103, further comprising the steps of comparing the calorie count value to the recommended daily calorie intake value for the user and displaying to the user an approval indicator based on the results of the comparison.

105. A method for planning calorie consumption according to any one of claims 58 to 104, where the step of specify a set of meals to be consumed is achieved by reading the barcode of the meal to be consumed.

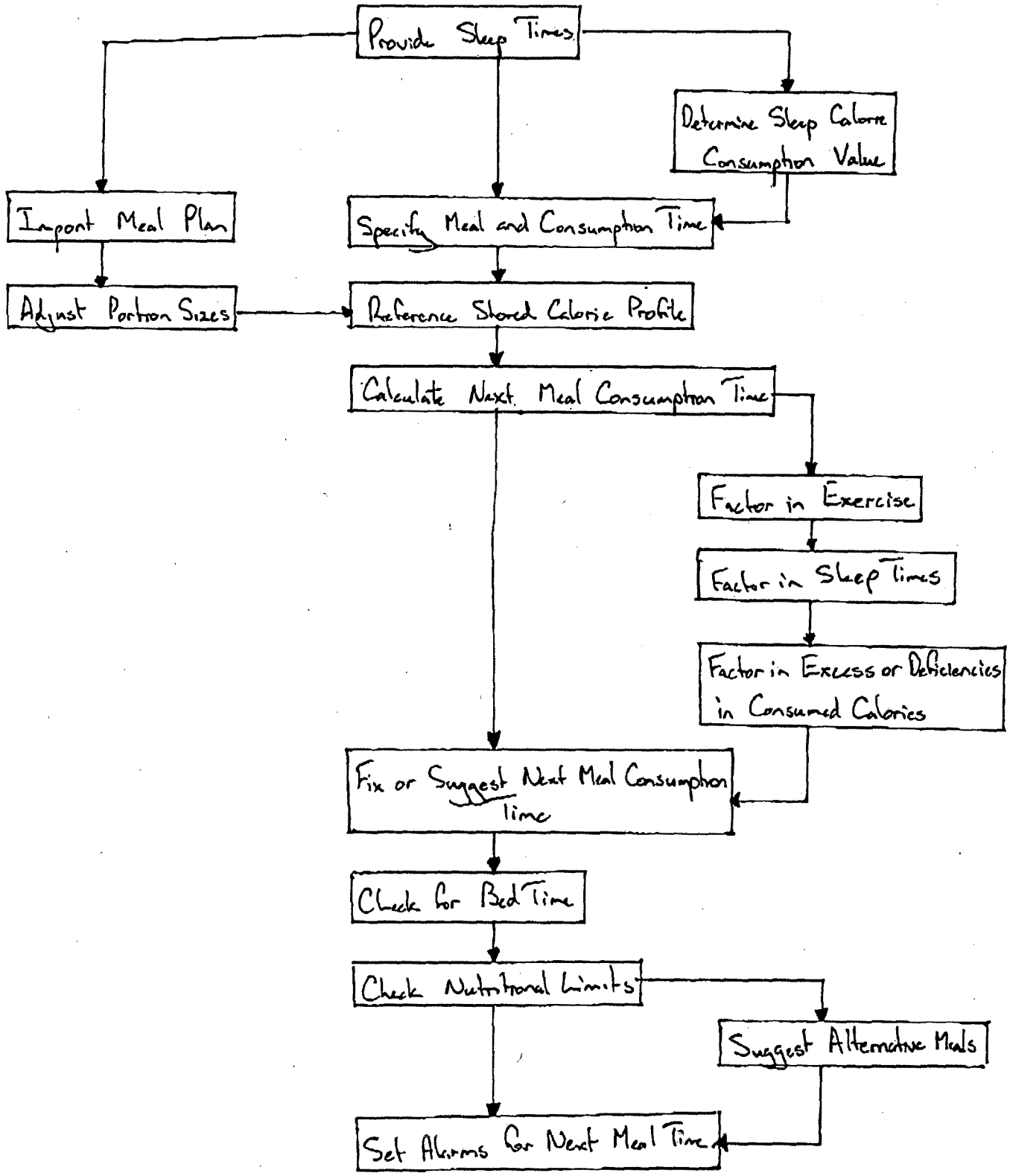106. A computer readable medium having software recorded thereon that, when executed on an appropriate processing device, performs the method according to any one of claims 58 to 105.
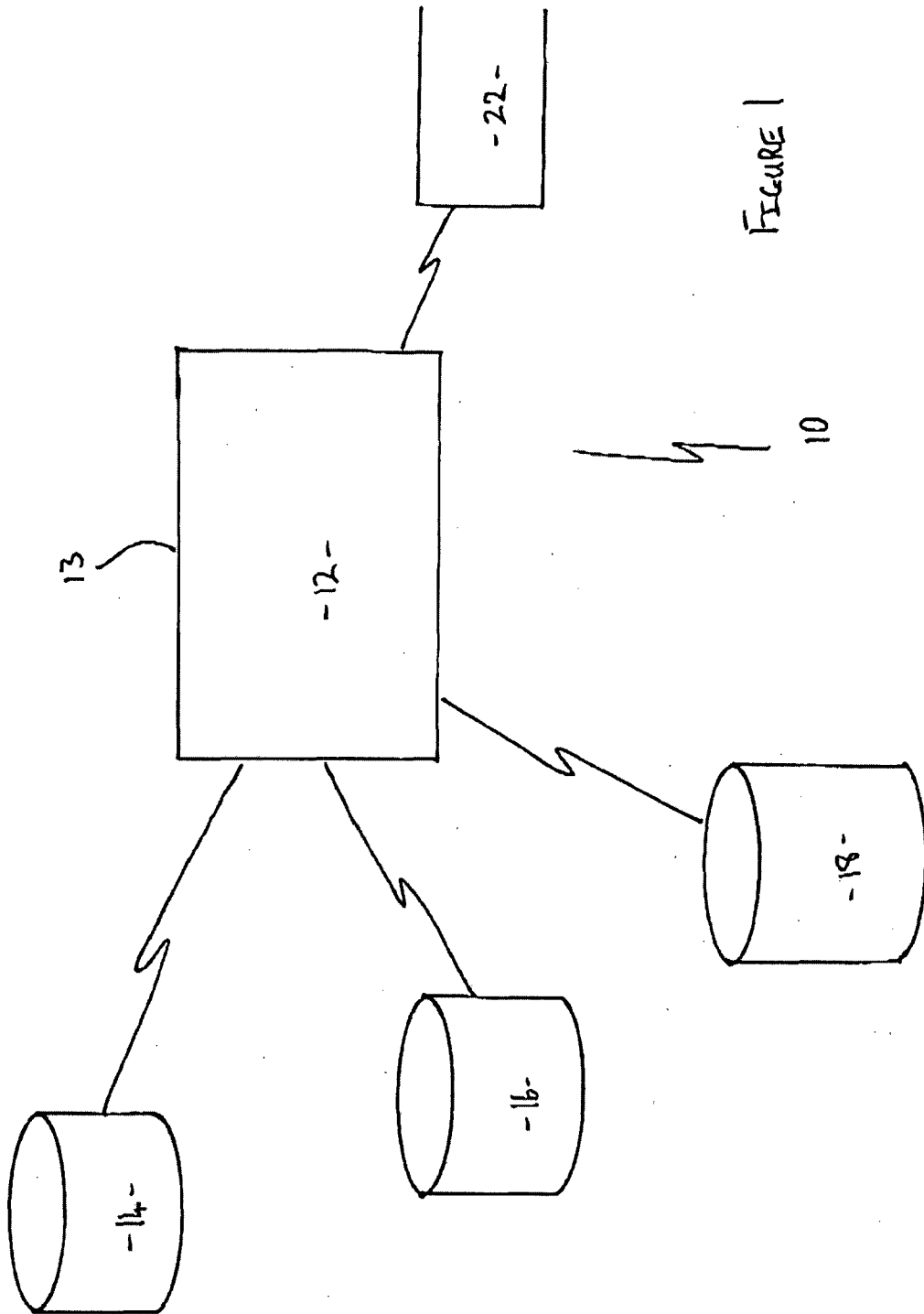
FIGURE 1
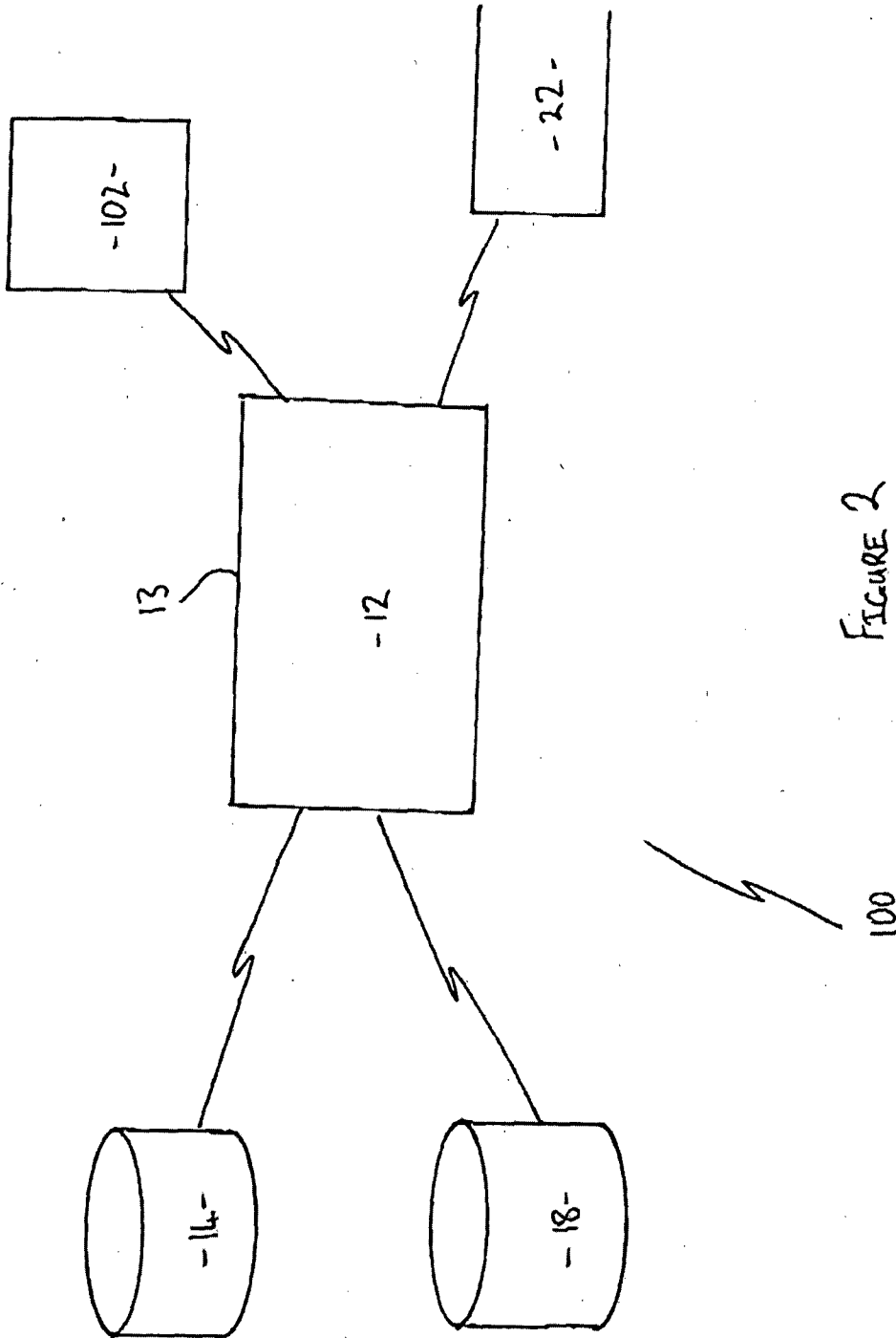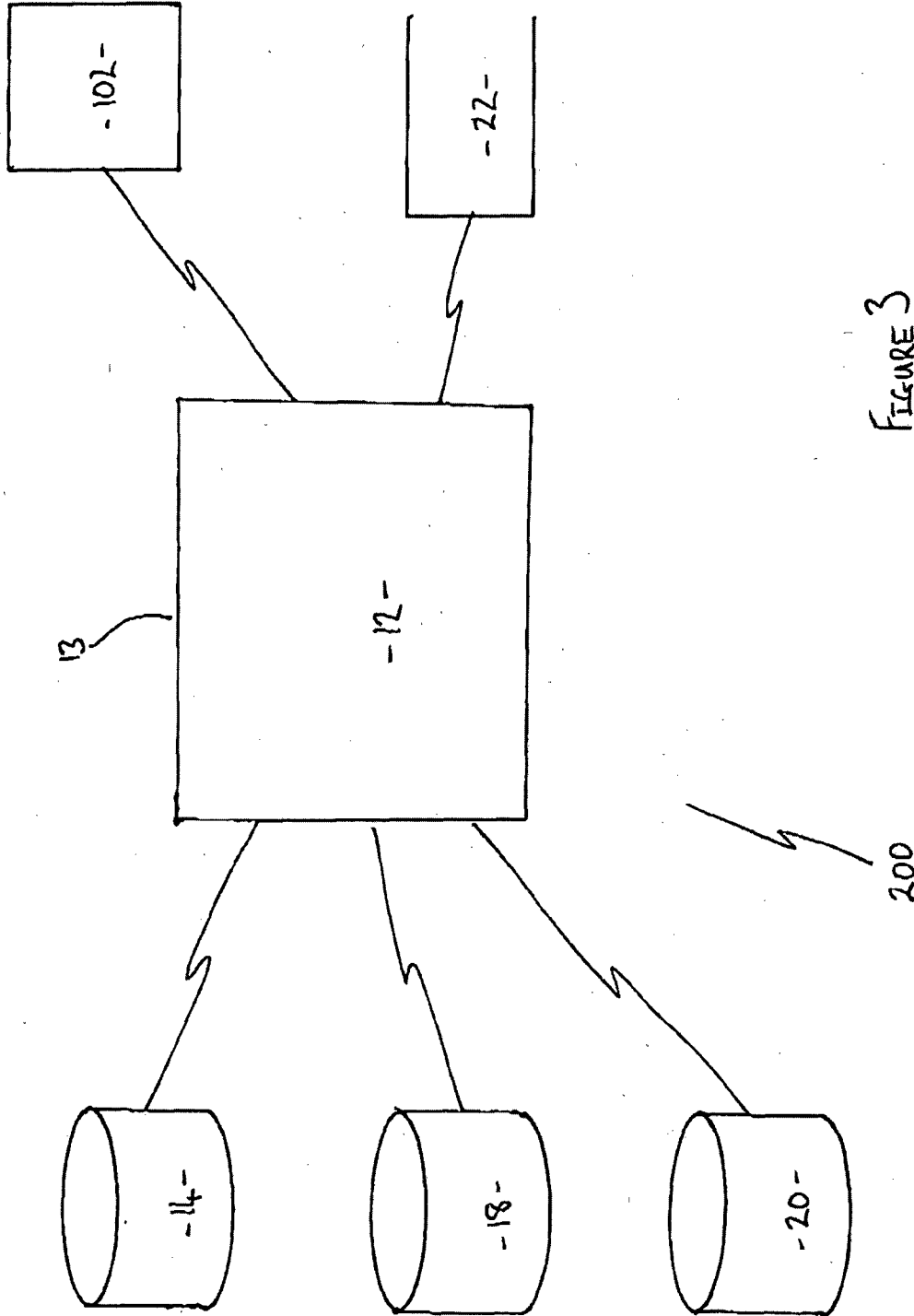
FIGURE 2
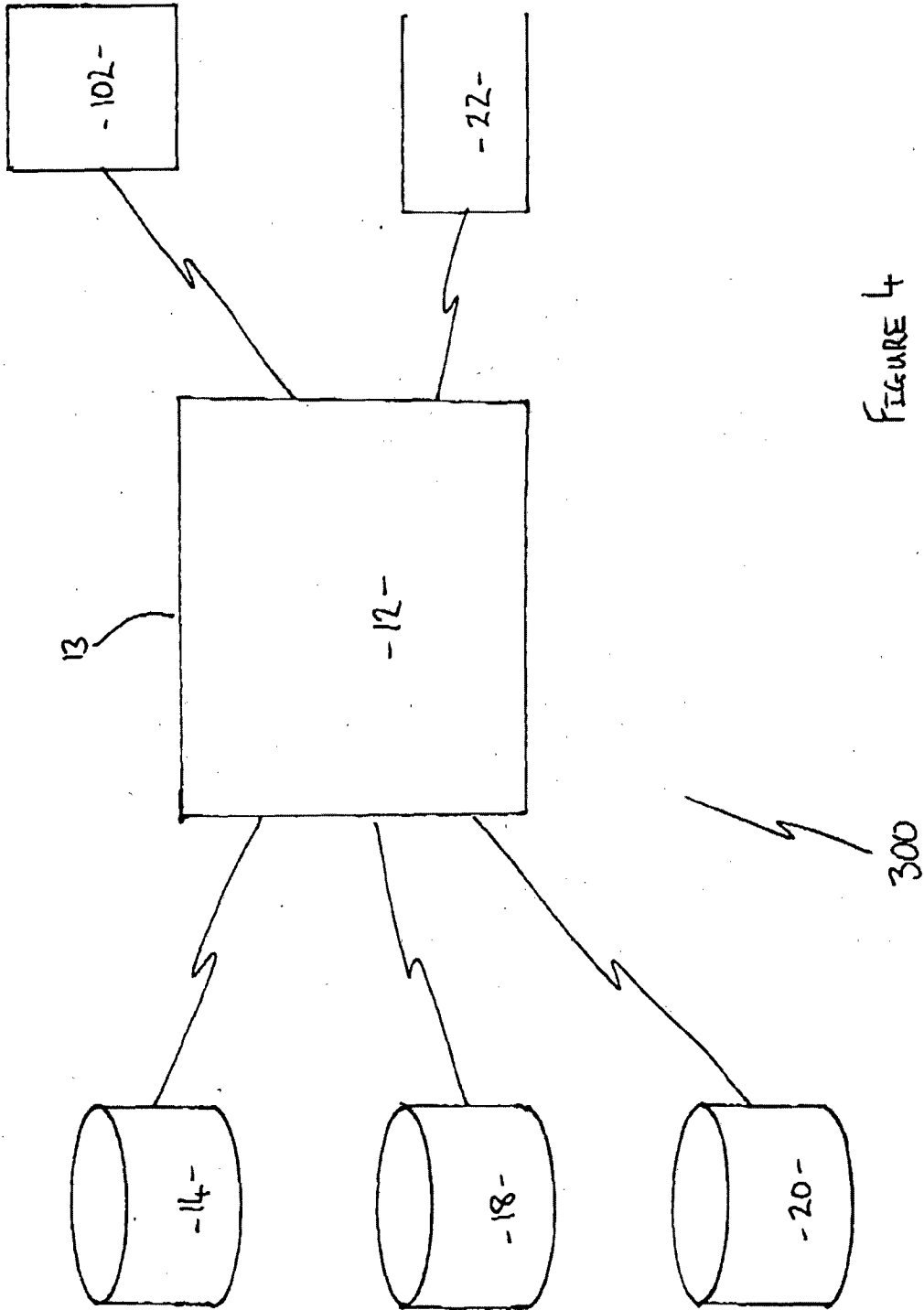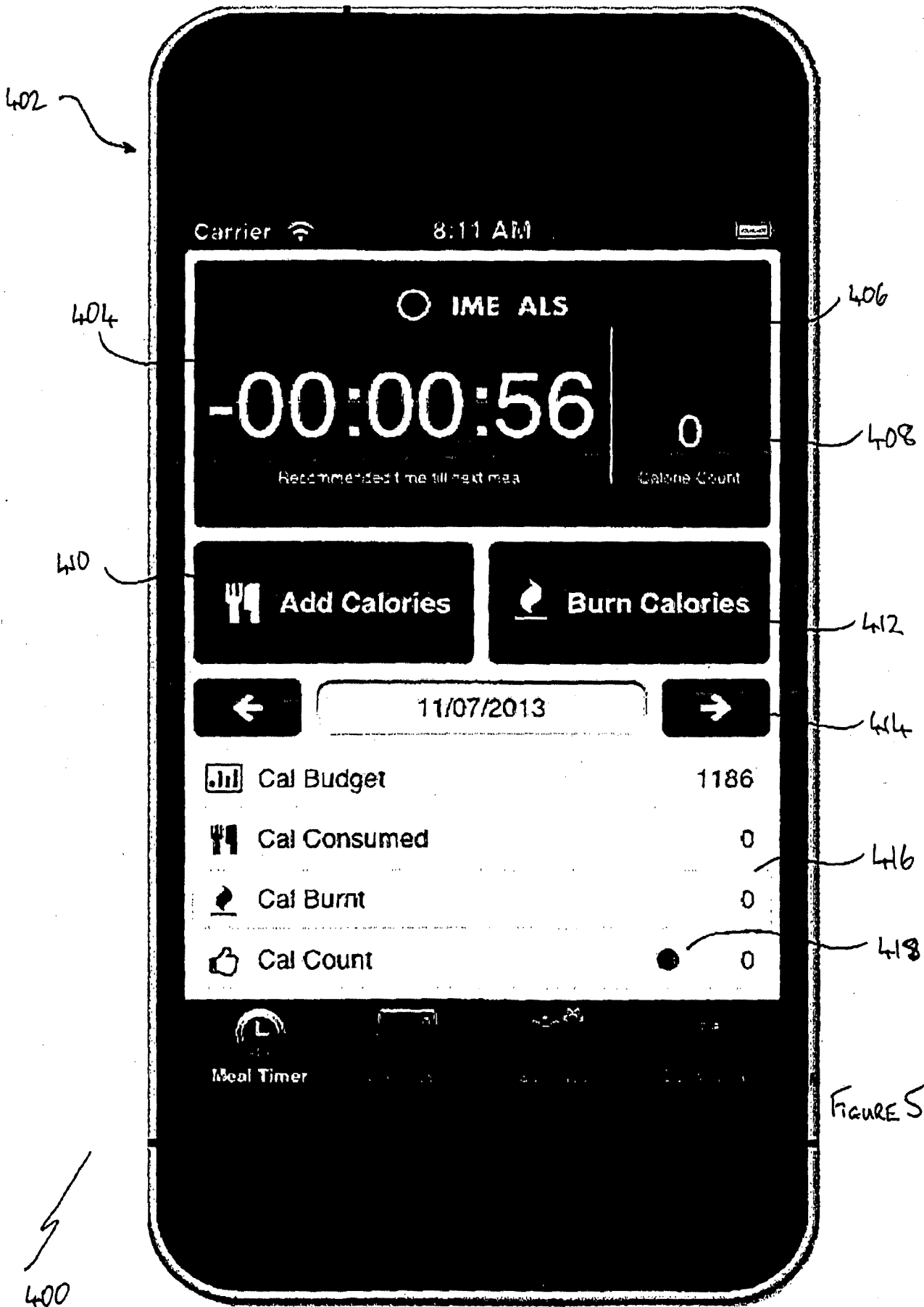
FIGURE 3

FIGURE 4

FIGURE 5
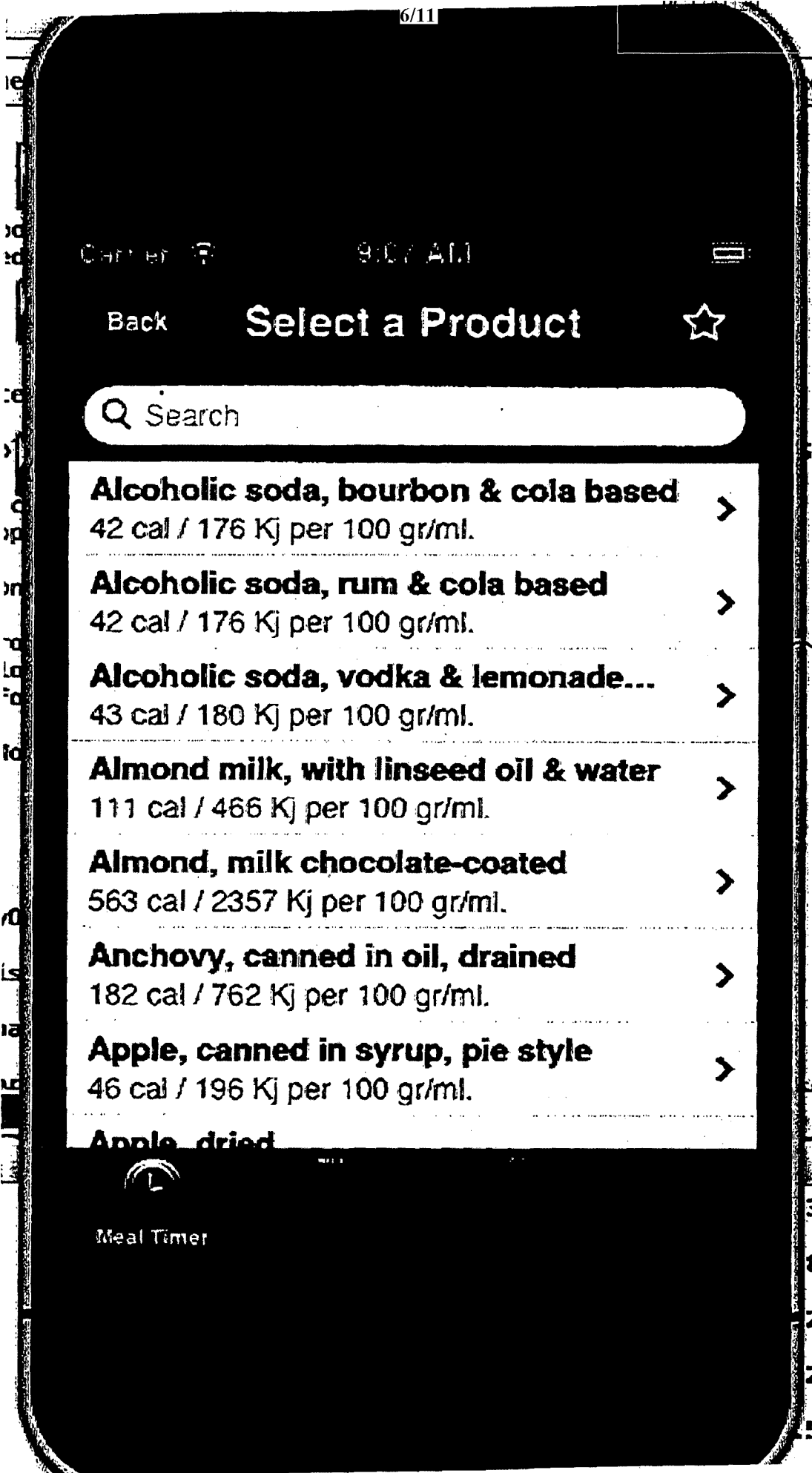
Back   **Select a Product**   ☆

🔍 Search

Alcoholic soda, bourbon & cola based 〉
42 cal / 176 Kj per 100 gr/ml.

Alcoholic soda, rum & cola based 〉
42 cal / 176 Kj per 100 gr/ml.

Alcoholic soda, vodka & lemonade... 〉
43 cal / 180 Kj per 100 gr/ml.

Almond milk, with linseed oil & water 〉
111 cal / 466 Kj per 100 gr/ml.

Almond, milk chocolate-coated 〉
563 cal / 2357 Kj per 100 gr/ml.

Anchovy, canned in oil, drained 〉
182 cal / 762 Kj per 100 gr/ml.

Apple, canned in syrup, pie style 〉
46 cal / 196 Kj per 100 gr/ml.

Apple, dried

Meal Timer

~420

FIGURE 6

Figure 7

Figure 8

Obtain Demographic Details

Query RDI Database Based on Demographic Details

Calculate CPK Value, if necessary

Multiply CPK by weight

Factor in Exercise Levels

Calculate Exercise Calibrated CPK Value and Multiply by Weight

Add Discretionary Constant to Determine Daily Recommended Calorie Intake.
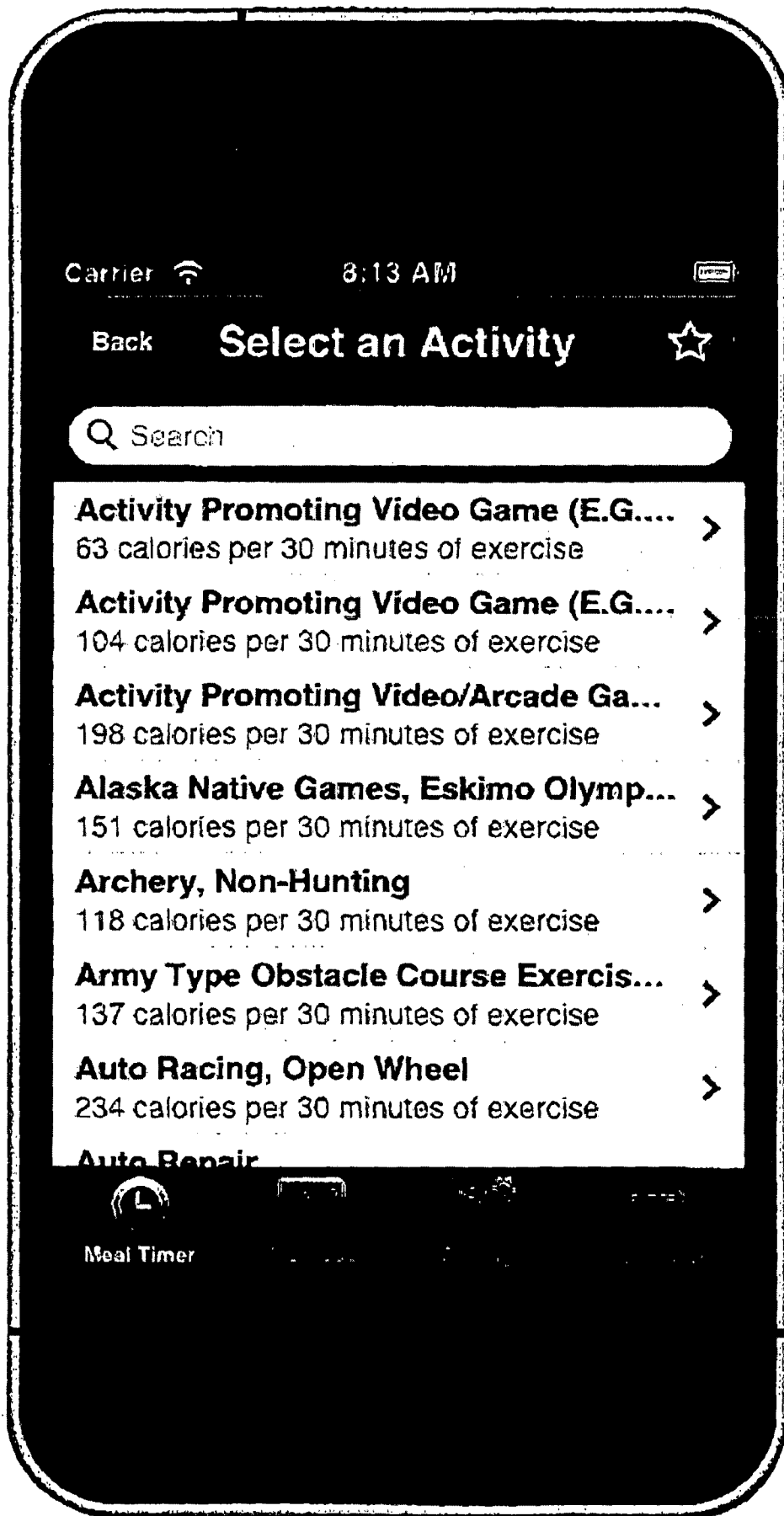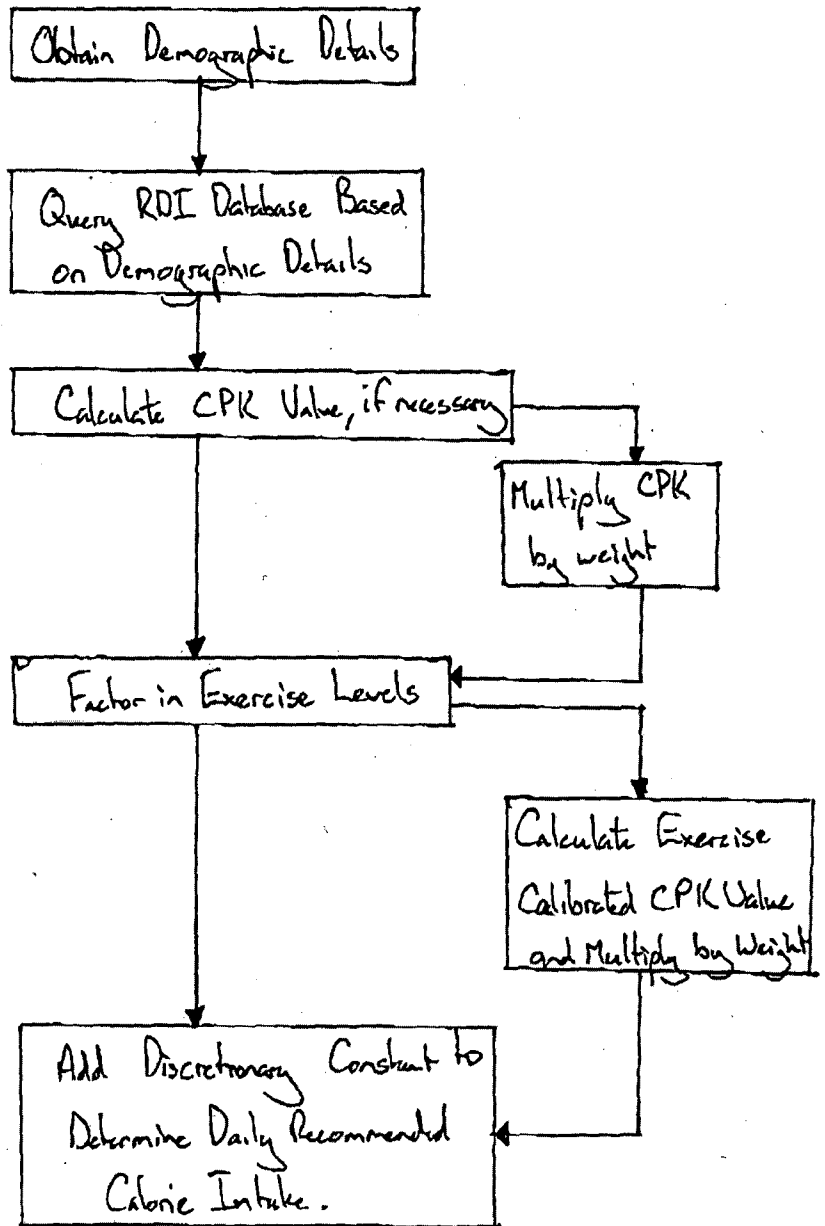
Figure 9

Figure 10

Figure 11
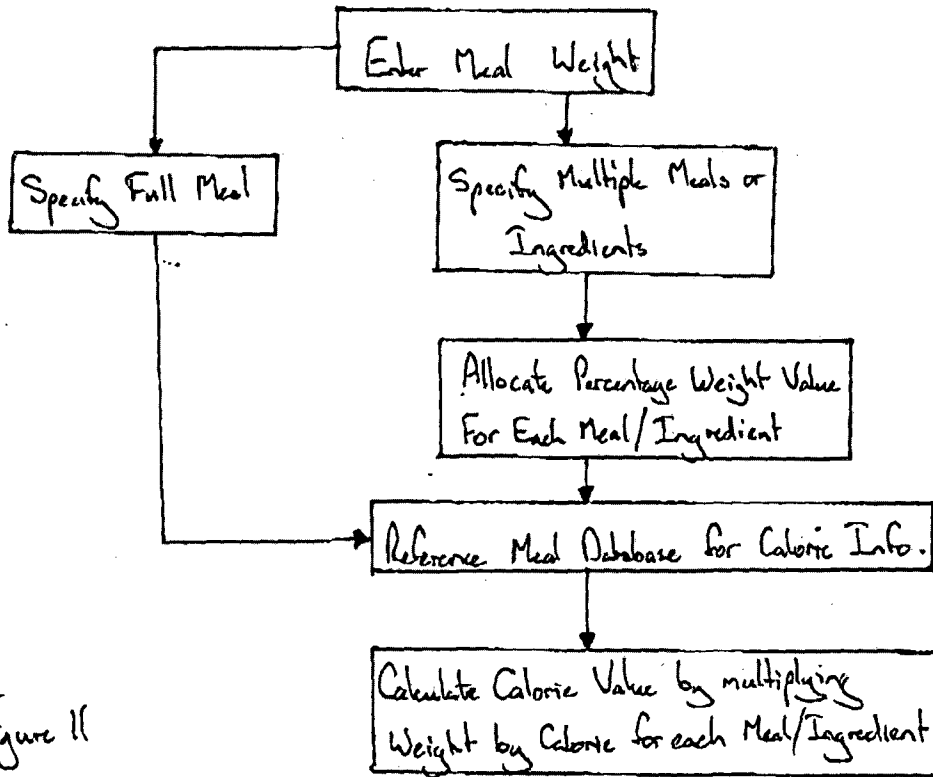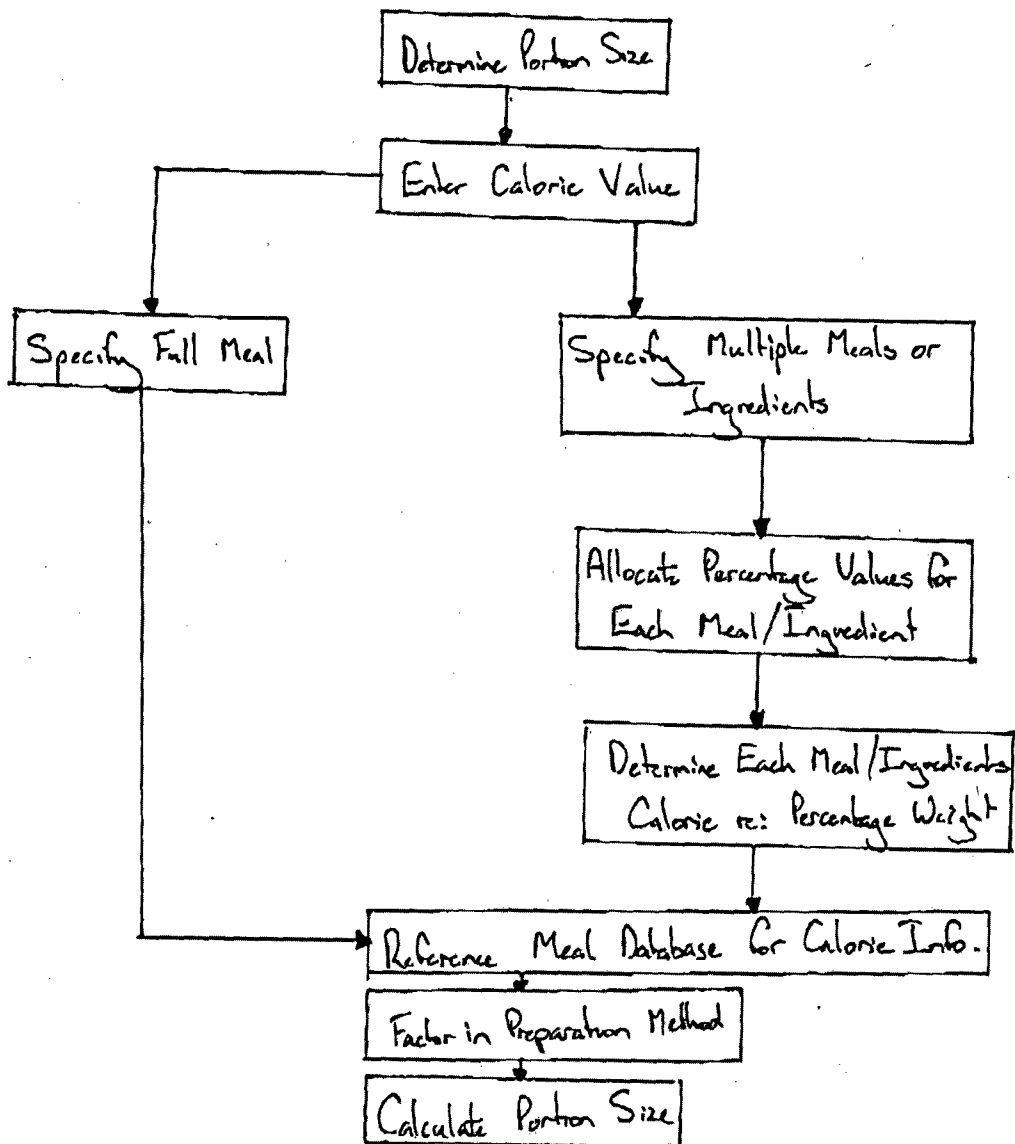
Determine Portion Size

↓

Enter Caloric Value

Specify Full Meal

Specify Multiple Meals or Ingredients

↓

Allocate Percentage Values for Each Meal/Ingredient

↓

Determine Each Meal/Ingredients Calorie re: Percentage Weight

↓

Reference Meal Database for Calorie Info.

↓

Factor in Preparation Method

↓

Calculate Portion Size

Figure 12

A. CLASSIFICATION OF SUBJECT MATTER

G06Q 50/22 (2012.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC with Keywords (MEAL, PLANNER, CALORIE, CONSUMPTION, EXPEND, TRACK) and like terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C   [X] See patent family annex

*	Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
22 October 2013	22 October 2013

Name and mailing address of the ISA/AU	Authorised officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au Facsimile No.: +61 2 6283 7999	Vivek Joshi AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0399359616

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	INTERNATIONAL SEARCH REPORT	International application No.
C (Continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	**PCT/AU2013/000779**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6513532 B2 (MAULT et al.) 04 February 2003 See Fig 4, Col 4 line 36- Col 5 line 39, Col 7 line 23- Col 8 line 41, Col 18 line 20- Col 19 line 36.	1 - 106
X	US 6675041 B2 (DICKINSON) 06 January 2004 See Fig 6 and the detailed description.	1 - 106
X	US 2003/0208110 A1 (MAULT et al.) 06 November 2003 See Fig 6 and summary of the invention.	1 - 106
X	US 2010/0191155 A1 (KIM et al.) 29 July 2010 See Para [0012]-[0015], Para [0030]-[0036], Para [0054]-[0060].	1 - 106
X	WO 2002/032037 A2 (HEALTHETECH INC.) 18 April 2002 See page 9 line 17- page 14 line 6, and page 14 line 28- page 25 line 30.	1 - 106

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		EP 1251773 A2	30 Oct 2002
		EP 1265524 A2	18 Dec 2002
		EP 1278455 A2	29 Jan 2003
		EP 1283689 A2	19 Feb 2003
		EP 1284642 A2	26 Feb 2003
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