

EXHIBIT A



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Alabaster

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(54) **METHOD AND SYSTEM FOR
COMPUTERIZED VISUAL BEHAVIOR
ANALYSIS, TRAINING, AND PLANNING**

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Alexandria, VA (US) 22309

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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(51) **Int. Cl.**⁷ **G09B 19/00**; G06F 17/00

(57) **ABSTRACT**

(52) **U.S. Cl.** **434/127**; 128/921

A system and method for computerized visual behavior
analysis, training, and planning. The system includes a User
Interface (UI), a Meal Database, a Food Database, a Picture
Menus, and a Meal Builder. The method can include the
following steps. First, the Meal Database and the Food
Database can be prepared. Second, the user can use the
Picture Menus to choose meals for a particular time period
to correspond to a customized eating plan. Third, the user
can decide whether or not to change one or more of the
meals he has chosen for the particular time period. If the user
decides to change his chosen meals, the user can edit or
create new meals using the Meal Builder. If the user decides
not to change his choices, or after the user changes his
choices, the user can save the meals for the particular time
period.

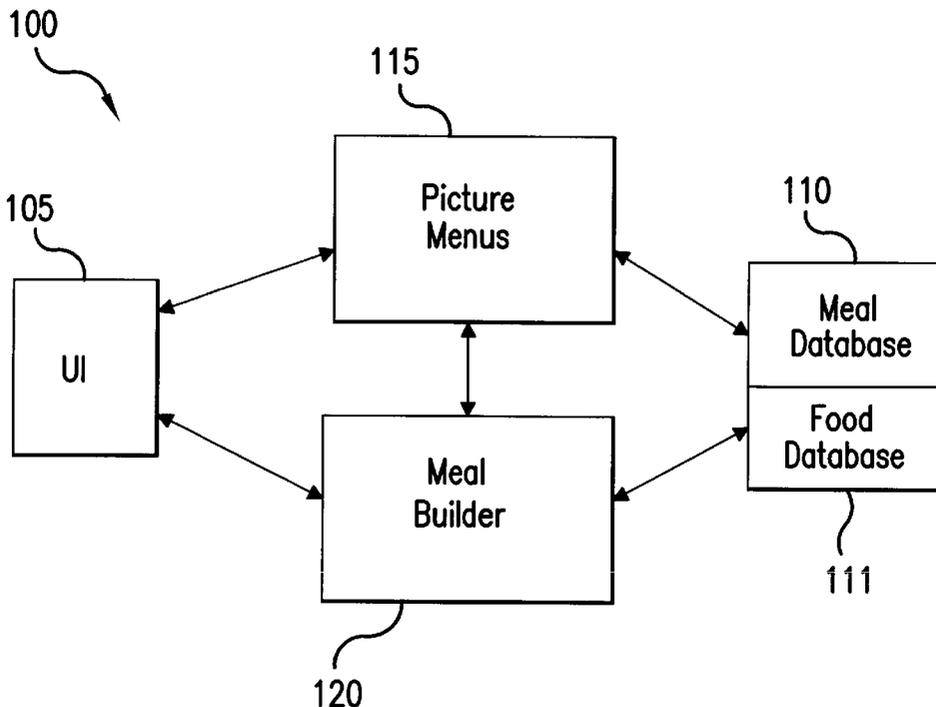
(58) **Field of Search** 434/127; 128/921;
700/104.1

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18 Claims, 10 Drawing Sheets



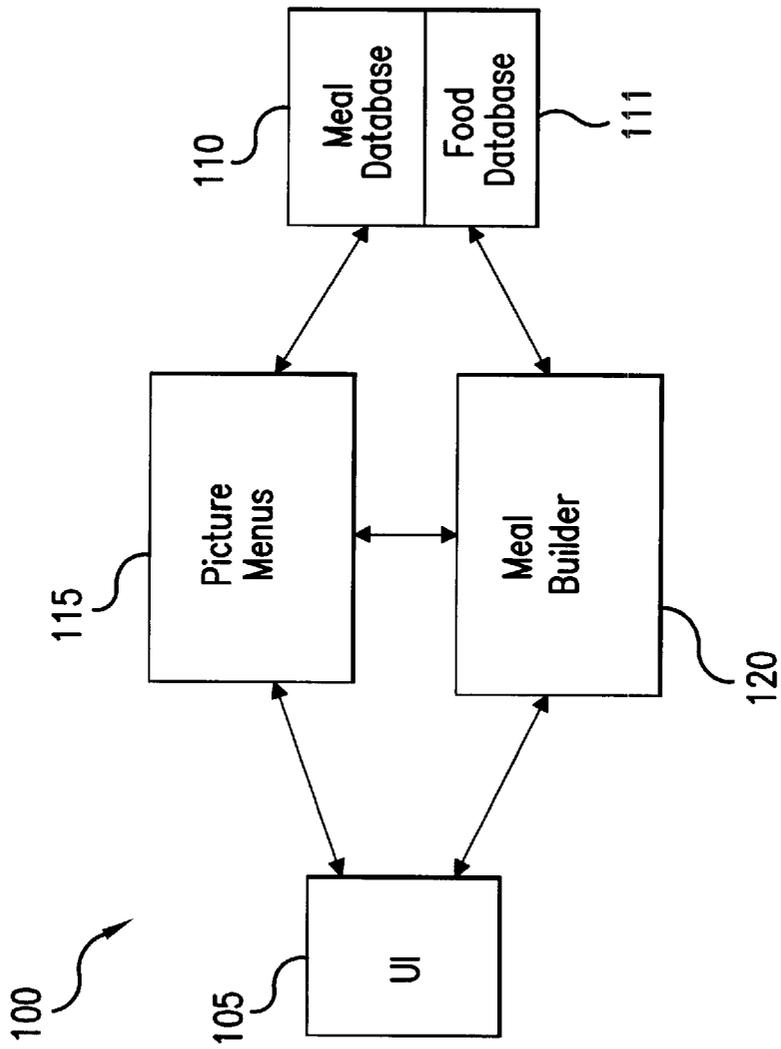


FIG.1

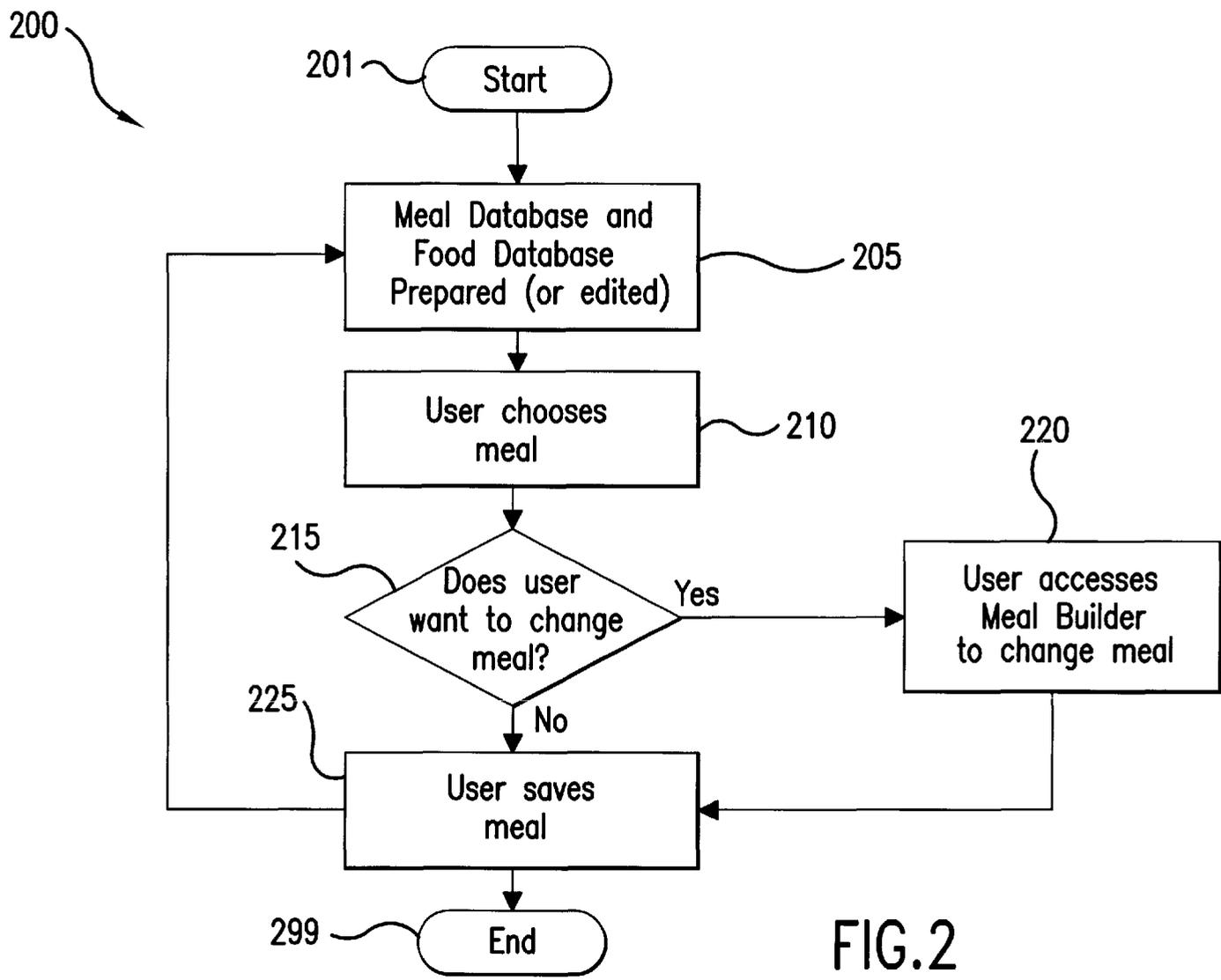


FIG. 2

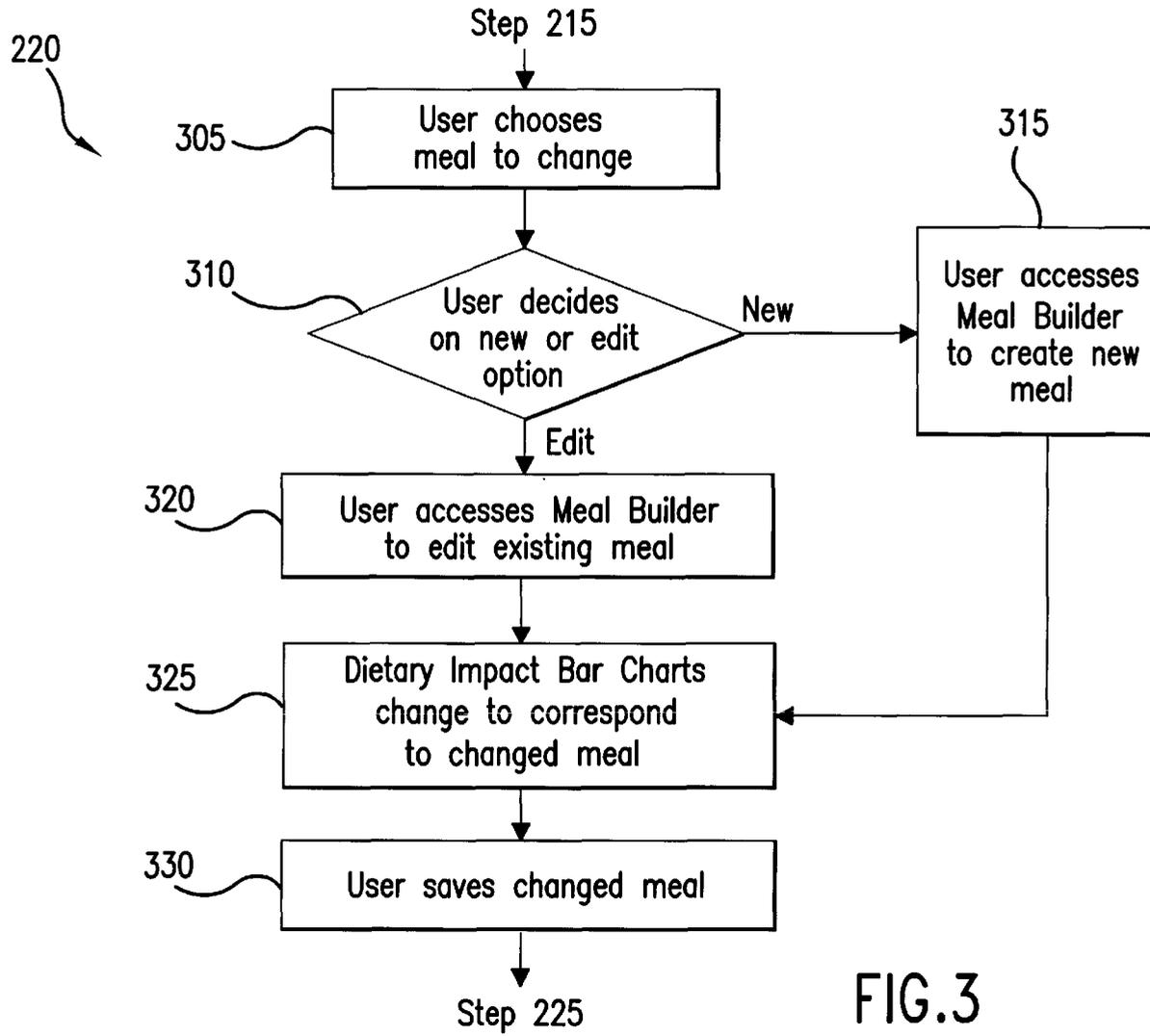


FIG.3

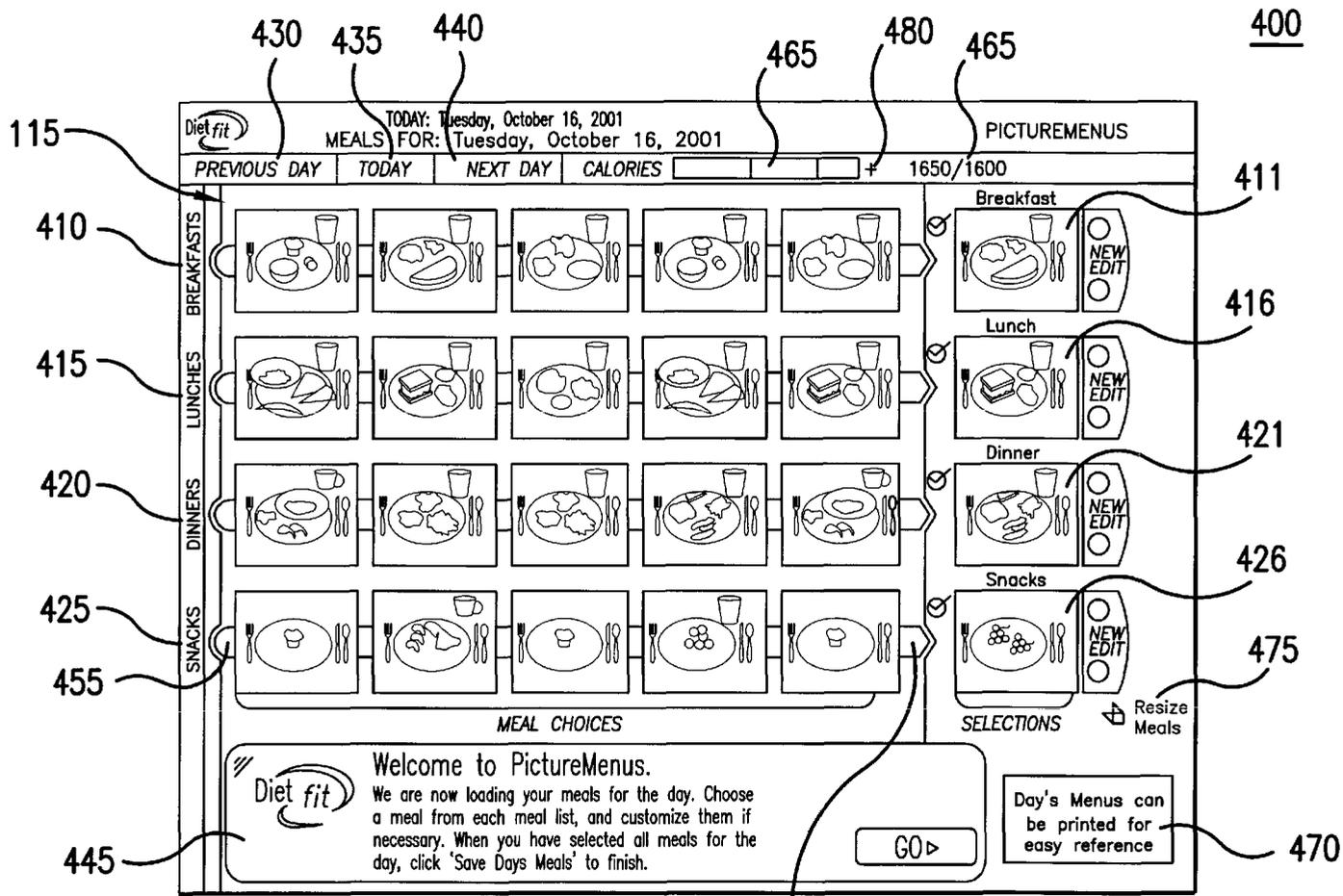


FIG. 4

460

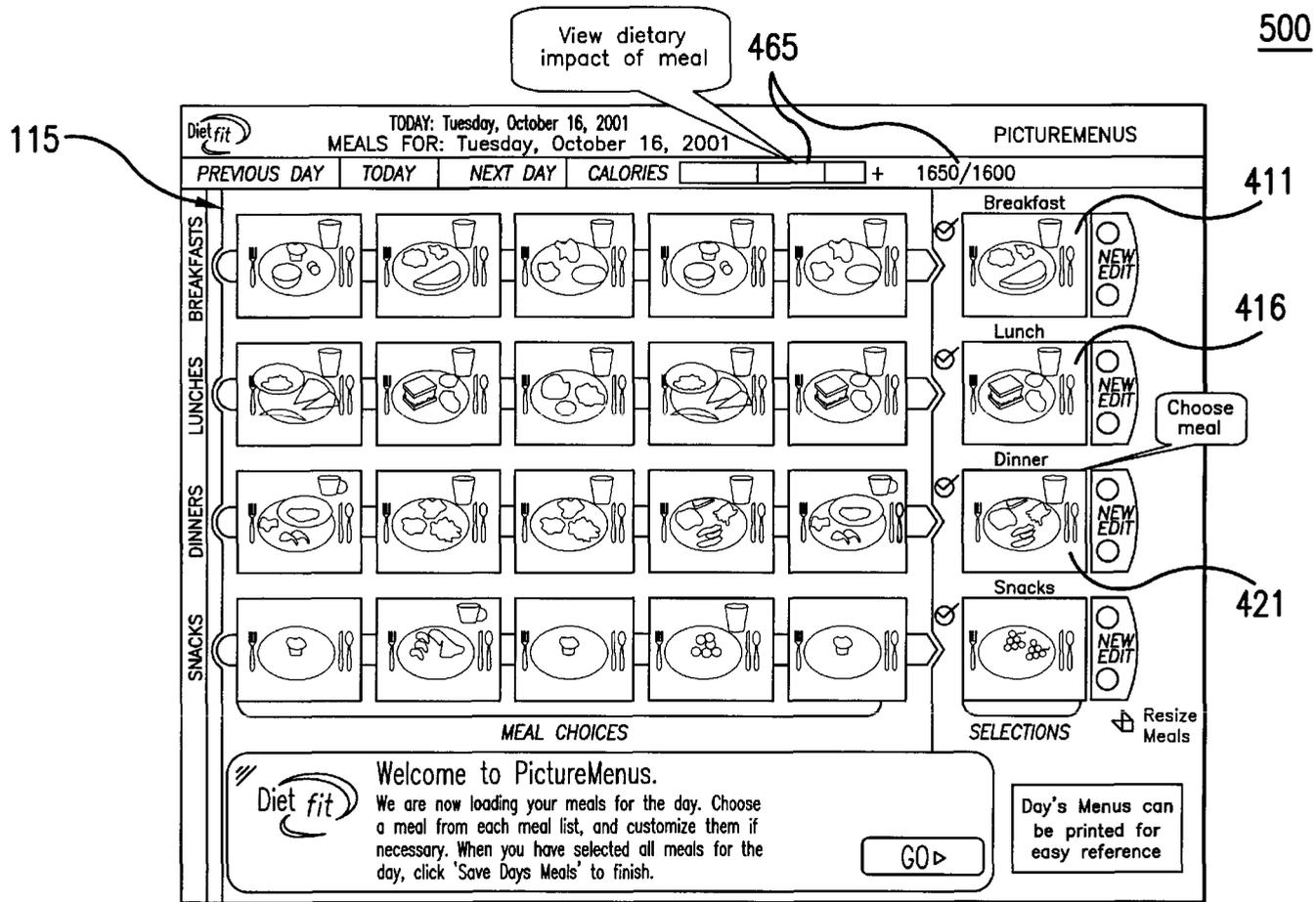


FIG.5

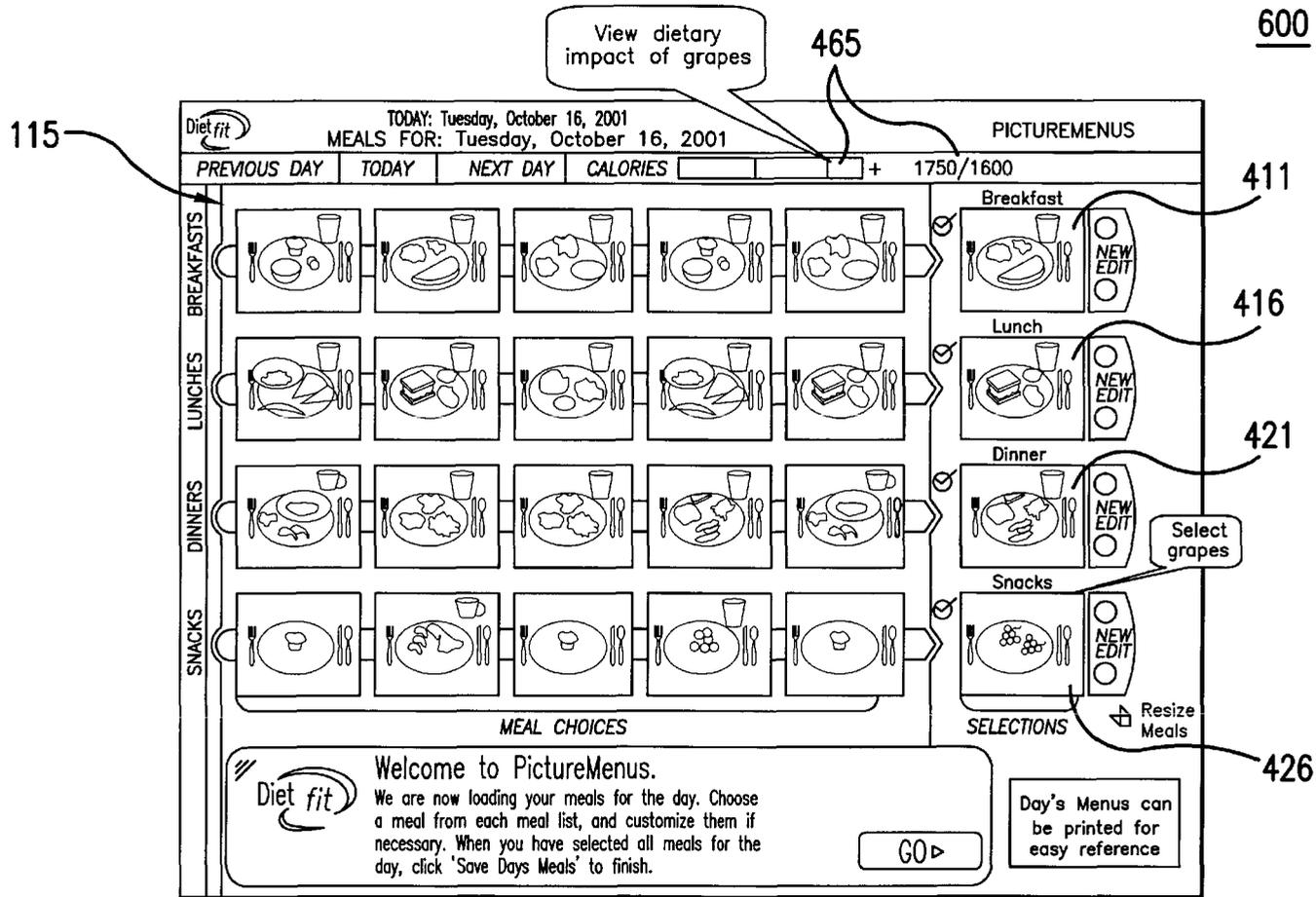


FIG. 6

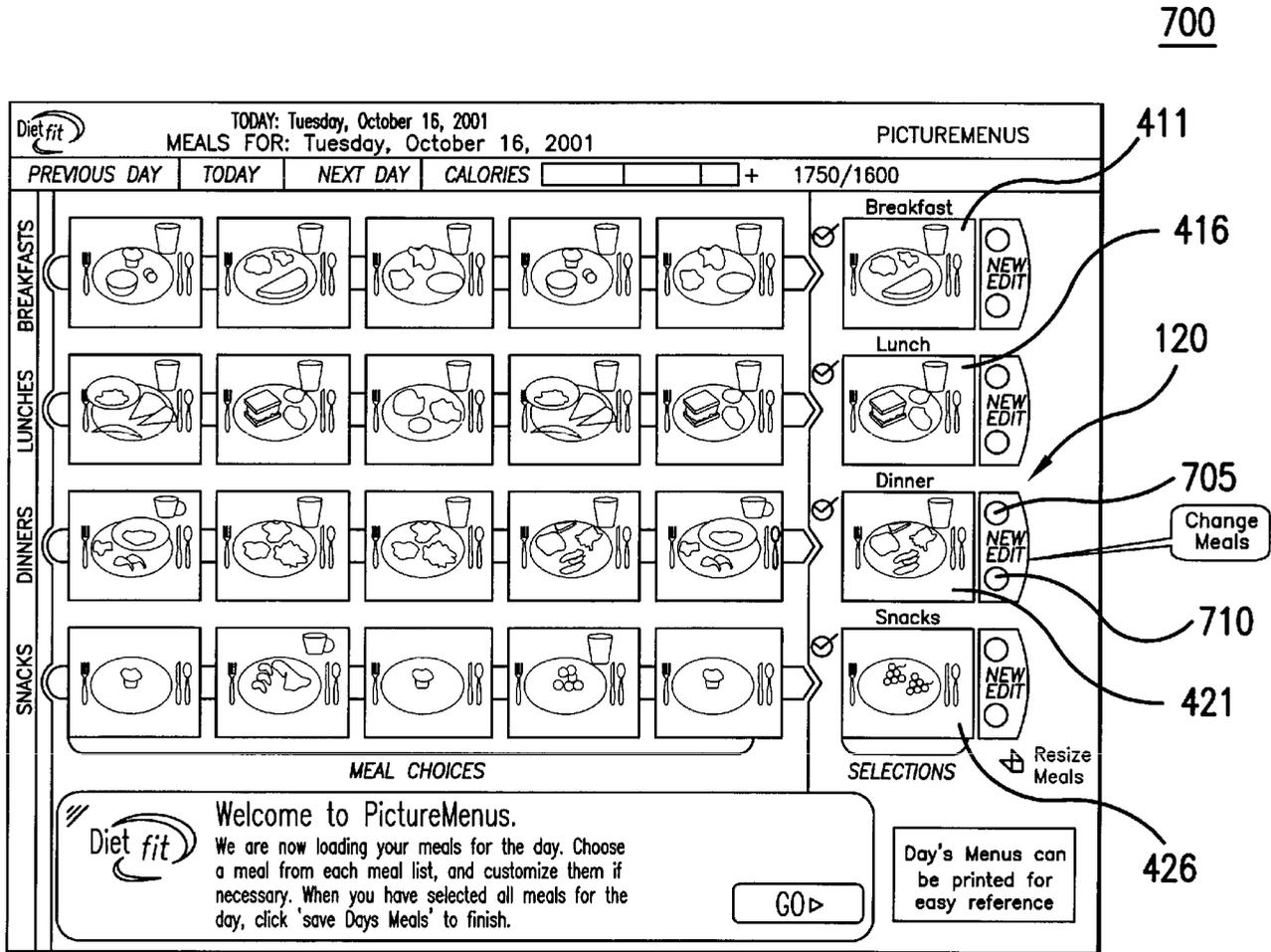
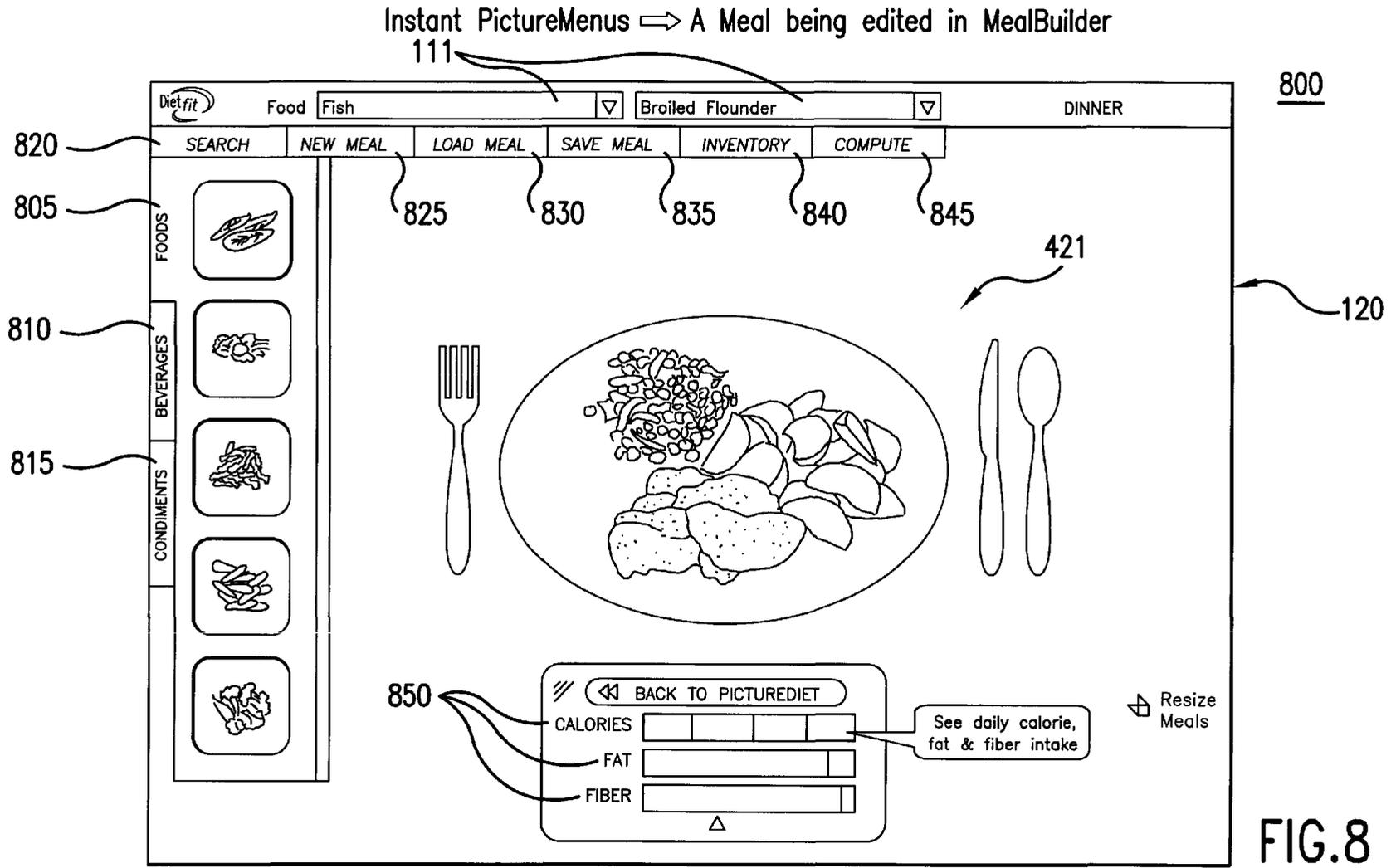


FIG. 7



Instant PictureMenus ⇨ A Meal being edited in MealBuilder

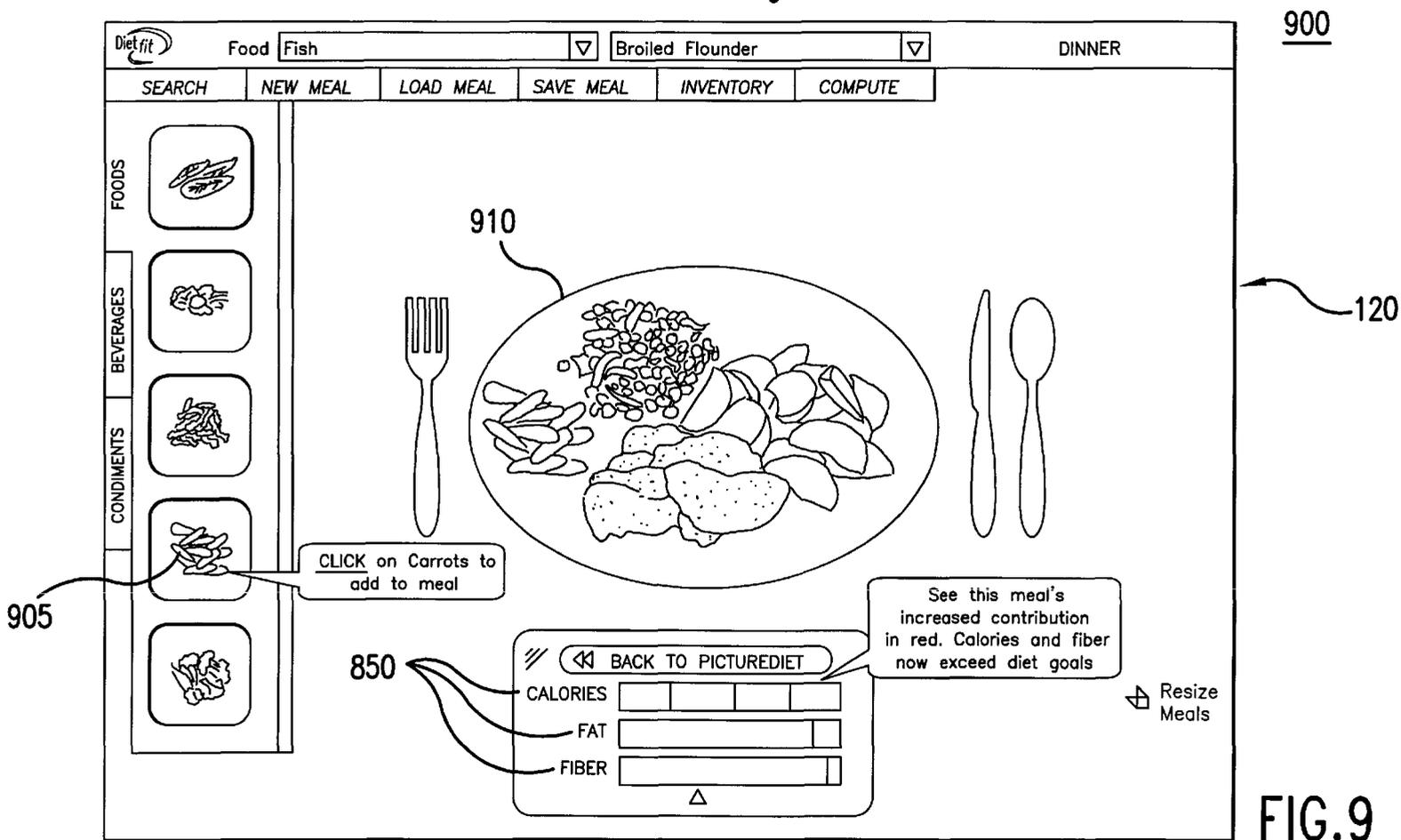


FIG.9

Instant PictureMenus for Daily Meal Planning (with Dinner Now Edited)

1000

Diet fit TODAY: Tuesday, October 16, 2001
MEALS FOR: Tuesday, October 16, 2001

PREVIOUS DAY TODAY NEXT DAY CALORIES + 1650/1600

BREAKFASTS

LUNCHES

DINNERS

SNACKS

MEAL CHOICES

SELECTIONS Resize Meals

See dietary impact of meal change

See carrots now included in meal

NEW EDIT

NEW EDIT

HEALTHY CHOICE

HEALTHY CHOICE

NEW EDIT

NEW EDIT

GO >

Welcome to PictureMenus.
We are now loading your meals for the day. Choose a meal from each meal list, and customize them if necessary. When you have selected all meals for the day, click 'Save Days Meals' to finish.

Day's Menu can be printed for easy reference

FIG.10

METHOD AND SYSTEM FOR COMPUTERIZED VISUAL BEHAVIOR ANALYSIS, TRAINING, AND PLANNING

BACKGROUND OF THE INVENTION

1. Field of the Invention

The subject invention relates to the field of computer-based methods of employing visual techniques for training individuals to modify behavior, and planning by individuals for modified behavior. Specific applications include training individuals to modify diet behavior, and planning by individuals for improved diet practices.

2. Background of the Technology

Present methods of evaluating dietary habits, motivating people to change eating habits, and teaching people how to make healthier food choices are woefully inadequate. Twenty years ago, twenty percent (20%) of Americans were obese. Now thirty-five percent (35%) of Americans are obese, despite the sales of countless diet books and the increasing availability of low calorie and low fat foods. In fact, American dietary habits were responsible for approximately forty percent (40%) of deaths in 1990, and they continue to produce an epidemic of obesity that is out of control.

No effective tools exist for either health professionals or the public that can adequately train people to understand and immediately recognize the significance of (1) the impact of customized meals on dietary goals; (2) the value and amount of specific macro and micro nutrients in different foods; (3) the potentially harmful effects of other naturally occurring substances found in many foods; and (4) the relative quantities of different food choices. Nor are there any planning tools that can show people how to create meals using food choices that are much more healthful for them and their families. In addition, no planning tools exist that use natural visual techniques to assist people to follow diet programs designed by health professionals.

Finally, no tools exist that allow user's to incorporate a behavior analysis into their eating goals, and their training or planning for meeting those eating goals. The behavior analysis collects and analyzes specific information on a user's instinctive eating tendencies and preferences. The behavior analysis can also compare the specific information to a set of goals. Allowing a user to incorporate the user's instinctive eating tendencies and preferences into his eating plan can have a profound effect on how effective the eating plan is. Food preferences can strongly influence the risk of obesity, diabetes, heart disease and cancer.

3. Related Art

U.S. Pat. No. 5,454,721 to Kuch discloses a system intended to teach individuals the relationship between the visual size and a few nutritional characteristics of portions of food by using either a life size image of, or the corporeal finger of the individual, as a scale against images of different sized portions of different kinds of food, while showing a few nutritional characteristics of such portions. The system proposed by Kuch is limited, in that, for example, it does not evaluate the user's ability to visually estimate macro and micro nutrient content of meals. Nor does it permit or incorporate analysis of an individual's natural tendencies and preferences. In addition, Kuch does not allow the user to prepare and plan and adapt meals that will help the user meet his customized eating goals.

U.S. Pat. No. 5,412,560 to Dennison relates to a method for evaluating and analyzing food choices. The method

relies on input by the individual or user of food actually consumed by the user during a given period of time and employs a computer program which attempts to estimate the actual intake of nutrients by the individual and to compare that intake to a recommended range of nutrients, such as those contained in dietary guidelines issued nationally in the United States. The approach of the Dennison patent is undesirable in that it relies on the individual to provide accurate input data as to his actual food intake, a task as to which there are many known obstacles and impediments, i.e., the approach is not "user friendly." Additionally, no graphic visual displays are provided, which further detracts from ease of use, comprehension and effectiveness.

SUMMARY OF THE INVENTION

The present invention can solve the above problems by providing a system and method for computerized behavior analysis, training, and planning. The system of programs can include a User Interface (UI), a Meal Database, a Food Database, Picture Menus, and a Meal Builder.

The UI can receive commands from the user and display results to the user from the Picture Menus and Meal Builder. The Meal Database can be a database of pre-set meals comprising combinations of foods that conform to predetermined characteristics that have been compiled. The Food Database is a database of foods that have been compiled. (Commercially made or pre-made meals can be included.)

In an alternate embodiment, the Meal Database and the Food Database can incorporate a behavior analysis. As explained in detail in pending U.S. patent applications Ser. Nos. 09/211,392, 09/461,664, and 09/734,711 (incorporated by reference), a behavior analysis comprises compiling and analyzing specific information on a user's instinctive preferences and tendencies. A behavior analysis can also compare the specific information to a set of goals. In an exemplary embodiment, the behavior analysis can be a diet behavior analysis which compiles and analyzes specific information on a user's instinctive eating preferences and tendencies, and then compares the specific information to a set of customized eating goals. Thus, the Meal Database and Food Database can be modified to include meals that the user has indicated he likes. In an alternative embodiment, meals that the user dislikes can be ignored by the user or deleted from the Meal Database and the Food Database.

The Picture Menus can display on the User Interface meals from the Database that the user can mix and match and still meet customized eating goals. The Picture Menus provide a quick and easy system of dietary impact (including nutritional and caloric impact) controlled meals that the user can mix and match at various nutritional, caloric, and other levels. In an exemplary embodiment, the invention can define the user's nutritional, caloric and other needs and let the user choose the diet he wants to follow. In response to data input regarding personal characteristics and activity level, calorie goals are defined, and daily meals are combined (and modified) to produce a daily total of various nutrients which can vary only +/-5% from the diet goals before a warning appears. While following the Picture Menus, the user can track his progress. If after a certain amount of time, the user hasn't yet reached his target weight, he can repeat the Picture Menus as often as necessary. Once the user's weight has stabilized, he can use the Picture Menus to maintain his weight.

The Meal Builder can display on the User Interface meals from the Database, corresponding to the Picture Menus, where the user can change and view the meals' impact on

customized eating goals. The Meal Builder can be a very useful tool, not only for modifying and personalizing Picture Menus, but also for designing meals and picturing favorite recipes. The Meal Builder can be a scoring system that allows the user to view, in real time, the impact of food choices on customized eating goals, and the accumulated impact on daily nutrition allowance made by saved meals and snacks throughout the day. The approximate distribution of calories and nutrients for each meal and snack can be shown using a selected diet plan.

The method for computerized behavior analysis, training, and planning can include the following steps. First, the Meal Database and Food Database can be prepared. Second, the user can choose meals for a particular day. Third, the user can decide whether or not to change one or more of the meals he has chosen for the particular day. If the user decides to change his chosen meals, the user can edit or create new meals using the Meal Builder. If the user decides not to change his choices, or after the user changes his choices, the user can save the meals for the particular day.

DESCRIPTION OF THE FIGURES

FIG. 1 displays the underlying architecture of an exemplary embodiment of the present invention.

FIG. 2 is a flow chart illustrating an exemplary overview process.

FIG. 3 is a flow chart illustrating an exemplary process for editing the user choices, as set forth in FIG. 2.

FIGS. 4-6 are exemplary screen shots illustrating the Picture Menu.

FIGS. 7-10 are exemplary screen shots illustrating the Meal Builder, and how it can be incorporated into the Picture Menu.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will be discussed with reference to preferred embodiments. Specific details will be set forth to provide a thorough understanding of the present invention. The preferred embodiments discussed herein should not be understood to limit the invention.

FIG. 1 displays the underlying architecture of an exemplary embodiment of the present invention. The system 100 includes a User Interface (UI) 105, a Meal Database 110, a Food Database 111, a Picture Menus 115, and a Meal Builder 120.

The UI 105 can receive commands from the user and display results to the user from the Picture Menus 115 and Meal Builder 120.

The Meal Database 110 is a database of pre-set meals that has been compiled. The Food Database 111 is a database of foods that has been compiled.

In an alternative embodiment, the Meal Database 110 and/or the Food Database 111 can incorporate a diet behavior analysis. These Databases 110 and 111 can be based on a diet behavior analysis of the user. These Databases 110 and 115 are customized through the expansion of the addition of foods and meals that conform to the users taste preferences and dietary goals. If the program learns the user likes certain foods, it will offer those foods first. If the program learns the user likes certain meals, it will offer those meals first. In an alternative embodiment, a user can populate a particular database with meals he has created.

The Picture Menus 115 are a quick and easy system of dietary impact controlled instant meals that the user can mix

and match at various nutritional, caloric, and other levels. Picture Menus 115 can be used as a stand-alone feature, or can include the Meal Builder 120. In an exemplary embodiment, the invention has already defined the user's nutritional, caloric, and other needs and has let the user choose the diet he wants to follow. In an exemplary embodiment, the user has also indicated his preferences and tendencies in a behavioral analysis. Daily meals are combined to produce a daily total of various nutrients which can vary only +/-5% from the diet goals before a warning appears. While following the Picture Menus 115, the user can track his progress. If after a certain amount of time, the user hasn't yet reached his target weight, he can repeat the Picture Menus 115 as often as necessary. Once the user's weight has stabilized, he can use the Picture Menus 115 to maintain his weight.

The Meal Builder 120 is a very useful tool, not only for modifying and personalizing Picture Menus 115, but also for designing meals and picturing favorite recipes. Meal Builder 120 can be used as a stand-alone feature, or can be used with the Picture Menus 115. Meal Builder 120 incorporates a scoring system that allows the user to view, in real time, the impact of food choices on daily intake, and the accumulated impact on daily nutrition allowance made by saved meals and snacks throughout the day. The approximate distribution of calories and nutrients for each meal and snack can be shown using a selected diet plan.

FIG. 2 is a flow chart illustrating an exemplary overview process 200. The overview process 200 starts with step 210. In step 205, a Meal Database 110 and Food Database 111 are prepared (or edited). In step 210, the user chooses meals (breakfast, lunch, dinner, and snacks) for a day. The terms breakfast, lunch, dinner, and snacks do not require a balanced or traditional meal, but simply denote food choices the user can make. For example, though unwise, a user can choose a plate of potato chips for breakfast and see how this affects his dietary goals. In an exemplary embodiment, the Picture Menus 115 are based upon the following distribution of calories: breakfast 25%, lunch 30%, snacks/beverages 15%, dinner 30%. These levels can be changed when the meals are edited using Meal Builder 120. However, daily meals are combined to produce a daily total which can vary only +/-5% before a warning appears. In step 215, the user decides whether or not to change the meals he has chosen for the day. If the user decides to change his chosen meals, the process moves to step 220, where the user can change (edit or create) meals using Meal Builder 120. If the user decides not to change his choices in 215, or after the user changes his choices in 220, the process moves to step 225, where the user saves the meals for that day. The process can be repeated by going back to step 205. The overview process 200 ends with step 299.

FIG. 3 is a flow chart illustrating an exemplary process for editing the user choices, as set forth in step 220 of FIG. 2. In step 305, the user chooses the meal he wants to change. In step 310, the user chooses the Edit or New option. If the user chooses the Edit option, the process moves to step 320, where the user accesses the Meal Builder 120 to edit the chosen meal. The user can edit a particular meal by removing, adding, decreasing, substituting, etc. food items, starting with the meal the user has chosen to edit. If the user chooses the New option, the process moves to step 315, where the user accesses the Meal Builder 120 to change the chosen meal. The user can choose a new meal by removing, adding, decreasing, substituting, etc. food items, starting with an empty plate. The user can change a particular meal by removing, adding, or substituting a food item.

Alternatively, the user can load a previously saved meal (and edit this if he chooses). Steps **315** and **320** move to step **325**, where the Dietary Impact Bar Charts are changed to correspond to the changed meal. In step **330**, the user saves the changed meal.

FIG. **4** illustrates an exemplary screen shot **400** illustrating the Picture Menus **115**. In this exemplary embodiment, the program has indicated, or the user has chosen, that he should follow a 1600 calorie diet. With this 1600 calorie goal, a breakfast, lunch, snack, and dinner can be combined to create the right number of calories.

The user chooses the breakfast, lunch, snack and dinner he wants for the day. These meals do not need to be well-balanced meals, but as a combination need to meet the 1600 calorie goal. The Breakfast Choices **410** indicate the meals the user can choose for breakfast. The Breakfast Choice **411** is boxed and indicates the user's breakfast choice for the particular day he is planning. The Lunch Choices **415** indicate the meals the user can choose for lunch. The Lunch Choice **416** is boxed and indicates the user's lunch choice for the particular day he is planning. The Dinner Choices **420** indicate the meals the user can choose for dinner. The Dinner Choice **421** is boxed and indicates the user's dinner choice for the particular day he is planning. The Snack Choices **425** indicate the meals the user can choose for snacks. The Snack Choice **426** is boxed and indicates the user's snack choice for the particular day he is planning. The Save Day's Meals **445** saves the choices **411, 416, 421**, and **426** the user has made for a particular day.

The user can Scroll Back **455** or Scroll Forward **460** on the Breakfast Choices **410**, Lunch Choices **415**, Dinner Choices **420**, and Snack Choices **425**. The user can choose or review the current day's meals by the Today Indicator **435**. The user can also look at meals for the Previous Day **430** or the Next Day **440**. The user can view the current calorie level in a bar graph and number form on the Nutrient Indicator **465**. While this is set for calories, any nutrient or quantifier, such as protein, can be measured on the Dietary Impact **465**. (This can be another type of indicator, such as any type of nutritional indicator.) Usually the user will try to make his choices closely match his dietary goals. If the user exceeds those goals, he will receive a + Warning Signal **480**. The user can print the Day's Menus using the Print **470**. The user can also record the menus in a health diary, print the menu, generate a customized shopping list that incorporates the meals chosen, record his weight, and track his progress. Graphs for these options can also be provided.

FIG. **5** is an exemplary screen shot **500** illustrating a use of the Picture Menus **115**. The user has already indicated a Breakfast Choice **411** and Lunch Choice **416**. The user chooses a Dinner Choice **421** comprising barbequed chicken, baked potatoes, and beans. The user views the Dietary Impact **465** (here it is calories, although this could be a nutritional or other impact) of the Dinner Choice **421** on his daily allowance, and sees that with his dinner choice, he has used 1650 (more than his allocated 1600) calories.

FIG. **6** is an exemplary screen shot **600** illustrating another use of the Picture Menus **115**. The user has already indicated a Breakfast Choice **411**, Lunch Choice **416**, and Dinner Choice **421**. The user adds a Snack Choice **426** of grapes. The user views the Dietary Impact **465** of the grapes on his daily allowance, and sees that the addition of the grapes makes it so he has used 1750 instead of 1650 calories.

FIG. **7** is an exemplary screen shot **700** illustrating the Meal Builder **120**. The user can change an existing Choice **411**, **416**, **421**, or **426** using Edit **710** or New **705**. For

example, the user can choose to change the Dinner Choice **421**. Once the user chooses the Edit **710** or the New **705**, the current Dinner Choice **421** will be shown in the Meal Builder **120**.

FIG. **8** is an exemplary screen shot **800** illustrating a use of the Meal Builder **120** for Dinner Choice **421**. The current Dinner Choice **421**, comprising barbequed chicken, baked potatoes, and beans, is shown. The user can access the Search **820**, the New Meal **825**, the Load Meal **830**, the Save Meal **835**, the Inventory **840**, and the Compute **845**. The Search **820** allows a user to search for a food in the Food Database **111**. The New Meal **825** will display an empty plate and allow the user to create a meal. The Load Meal **830** will allow the user to choose from saved meals that he already has. The Save Meal **835** allows the user to save a new meal he has created and give it a name. The Inventory **840** provides a written list of the foods on the plate. The Compute **845** allows the user to see the impact of the foods on the plate on his dietary goals. On some of these features, the user can access or provide recipes or details about certain foods.

The Dinner Choices **420** in the Meal Builder **120** is immediately associated with an increase in the user of the allotted amounts of calories and nutrients. This serves to show how adding each meal increases the calorie and nutrient intake during the day and how the impact of food choices can be seen in the bar charts. Excesses and deficiencies can be easily spotted and remedied. Other nutrients can be seen on demand, as can a more detailed numerical analysis.

If the user is using the New **705**, the user is presented with a clean plate. The user then activates the window containing the desired food, and drags that food onto the plate. In the Dinner Choices **420**, the user can choose from different Foods **805**, Beverages **810**, and Condiments **815**. The user can adjust portions by clicking on each food on the plate and then selecting a plus or minus button. An "X" button removes the food from the plate.

As foods are added or removed, the user will see the Dietary Impact Bar Charts **850** change immediately. In this example, the calorie, fat, and fiber intake is shown. This indicates the contribution each food makes to the user's nutrition and calorie intake. Condiments and beverages are added in a similar way. Using Meal Builder **120**, the user can build his own personal library of favorite meals.

FIG. **9** is an exemplary screen shot **900** of a use of the Meal Builder **120**. In this example, the user clicks on the Carrot Choice **905**. The Carrot Choice **905** then appears on the Plate **910**. The user is able to adjust the portion size of the Carrot Choice **905** and see the Dietary Impact Bar Charts **850** change to correspond to the different portion sizes of the Carrot Choice **905**.

FIG. **10** is an exemplary screen shot **1000** of a use of the Meal Builder **120**, as accessed in the Picture Menus **115**. Once the user saves the Carrot Choice **905** on his Dinner Choice **421**, the user is taken back to the Picture Menus **115**. The user can see the Carrot Choice **905** included in his Dinner Choice **421**. The user can also see the Dietary Impact **465** of the meal change, with the inclusion of the Carrot Choice **905**.

What is claimed is:

1. A system of computerized meal planning, comprising:
 - a User Interface;
 - a Database of food objects organizable into meals; and
 - at least one Picture Menus, which displays on the User Interface meals from the Database that a user can select from to meet customized eating goal.

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- 2. A system of computerized meal planning, comprising:
 - a User Interface;
 - a Database of food objects; and
 - a Meal Builder, which displays on the User Interface meals from the Database, and wherein a user can change content of said meals and view the resulting meals' impact on customized eating goals.
- 3. The system of claim 1, further comprising:
 - a Meal Builder, which displays on the User Interface meals from the Database, corresponding to the Picture Menus, where the user can change the content of said meal's and view the resulting meal's impact on customized eating goals.
- 4. The system of claim 1, wherein the meal planning is designed to impact eating behavior.
- 5. The system of claim 1, wherein food objects are food images.
- 6. The system of claim 1, wherein the Database further comprises:
 - a Food Database comprising the food objects incorporated into the Meal Builder; and
 - a Meal Database comprising various combinations of the food objects designated as meals and incorporated into the Meal Builder and the Picture Menus.
- 7. The system of claim 1, wherein the Database is based on a behavior analysis comprising collecting and analyzing specific information on a user's instinctive tendencies and preferences.
- 8. The system of claim 6, wherein the Food Database and the Meal Database are based on a behavior analysis comprising collecting and analyzing specific information on a user's instinctive tendencies and preferences.
- 9. The system of claim 7, wherein the behavior analysis further comprises comparing the specific information to a set of goals.
- 10. The system of claim 7, wherein the behavior analysis is a diet behavior analysis comprising collecting and analyzing specific information on a user's instinctive eating tendencies and preferences.
- 11. The system of claim 10, wherein the diet behavior analysis further comprises comparing the specific information to a set of customized eating goals.
- 12. A method of computerized planning that can influence behavior, comprising:

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- preparing a Database of food objects;
- allowing a user to choose meals from one or more Picture Menus, which display on a User Interface meals comprised from the food objects from the Database that the user can mix and match to meet customized eating goals, for a particular amount of time; and
- allowing a user to save the meals.
- 13. A method of computerized planning that can influence behavior, comprising:
 - preparing a Database of food objects;
 - allowing the user to decide whether or not to change one or more meals comprising food objects; and
 - if the user decides to change one or more of the meals, allowing the user to change the meals using a Meal Builder, which displays on the User Interface the food objects from the meals from the Database, corresponding to the Picture Menus, where the user can change and view the meals' impact on customized eating goals.
- 14. The system of claim 12, further comprising:
 - allowing the user to decide whether or not to change one or more of the meals; and
 - if the user decides to change one or more of the meals, allowing the user to change the meals using a Meal Builder, which displays on the User Interface the food objects from the meals from the Database, corresponding to the Picture Menus, where the user can change and view the meals' impact on customized eating goals.
- 15. The system of claim 12, further comprising the step of incorporating a behavioral analysis comprising collecting and analyzing specific information on a user's instinctive tendencies and preferences into the Database.
- 16. The system of claim 15, wherein the behavior analysis further comprises comparing the specific information to a set of goals.
- 17. The system of claim 15, wherein the behavior analysis is a diet behavior analysis comprising collecting and analyzing specific information on a user's instinctive eating tendencies and preferences.
- 18. The system of claim 17, wherein the diet behavior analysis further comprises comparing the specific information to a set of customized eating goals.

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