

FIG. 1

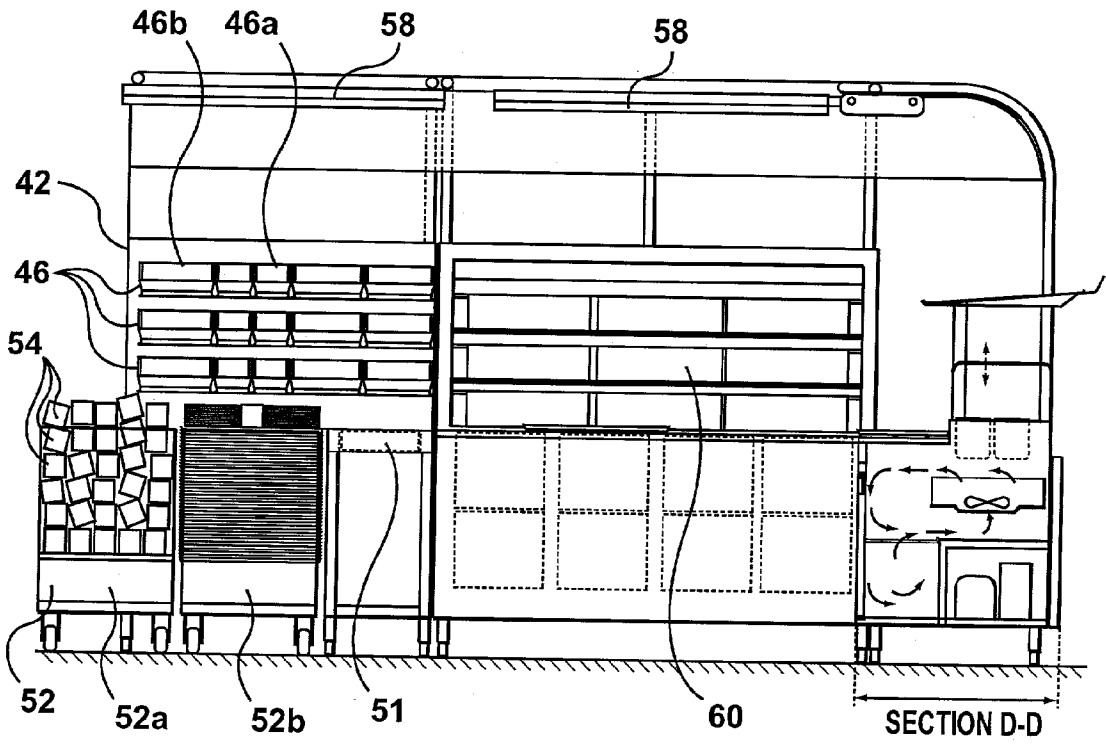


FIG. 2

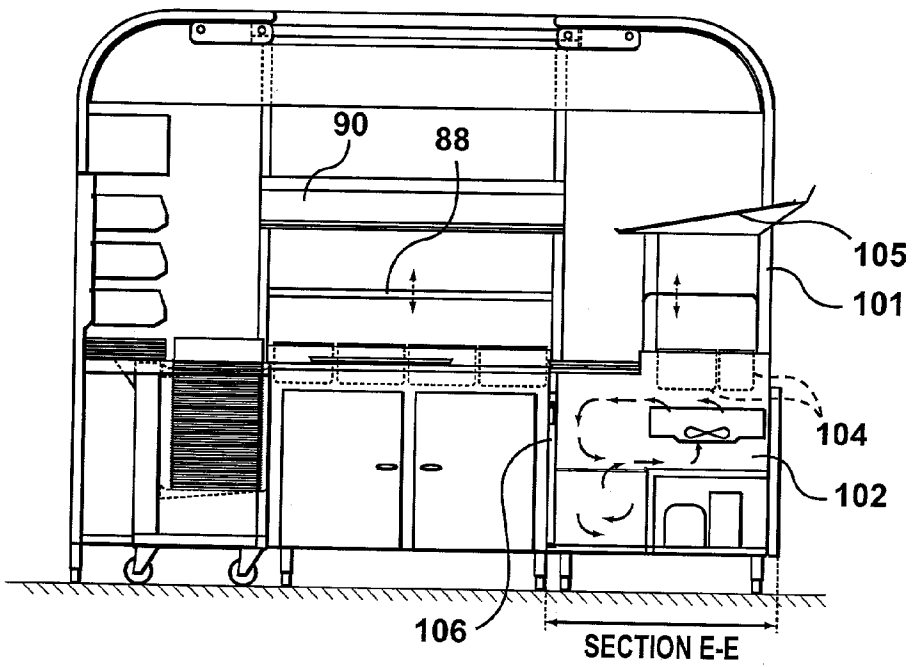


FIG. 3

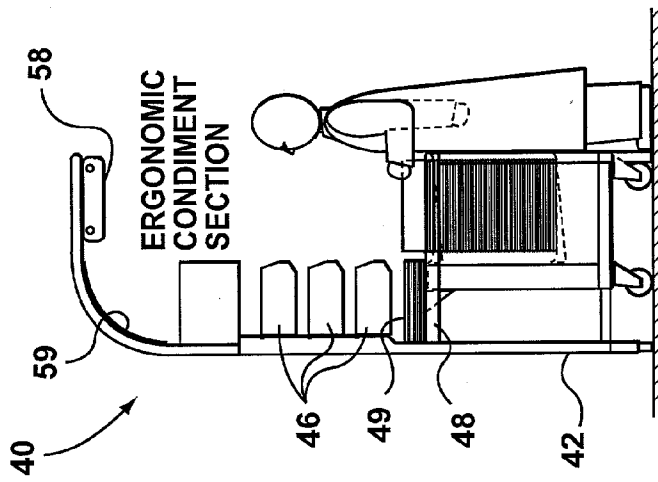


FIG. 4

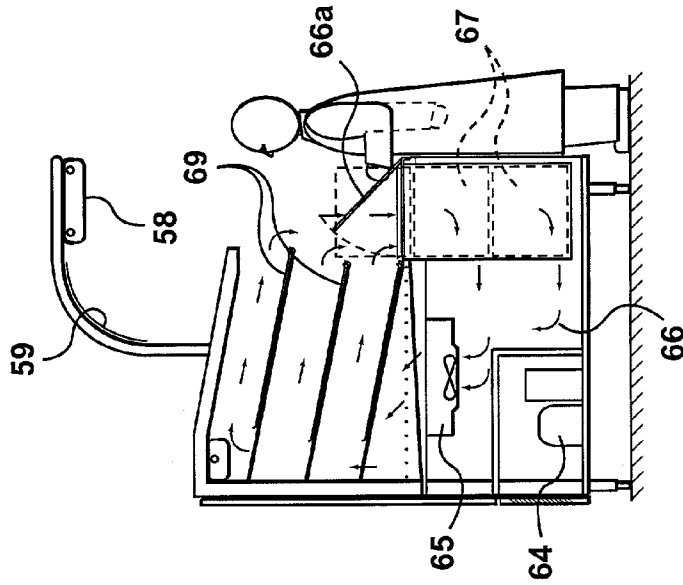


FIG. 5

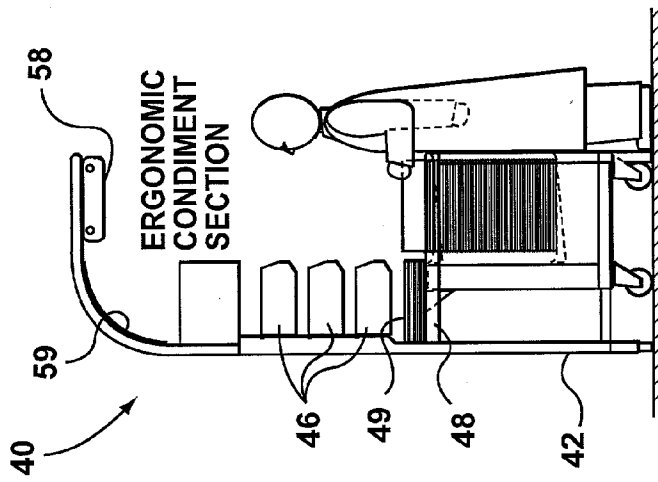


FIG. 6

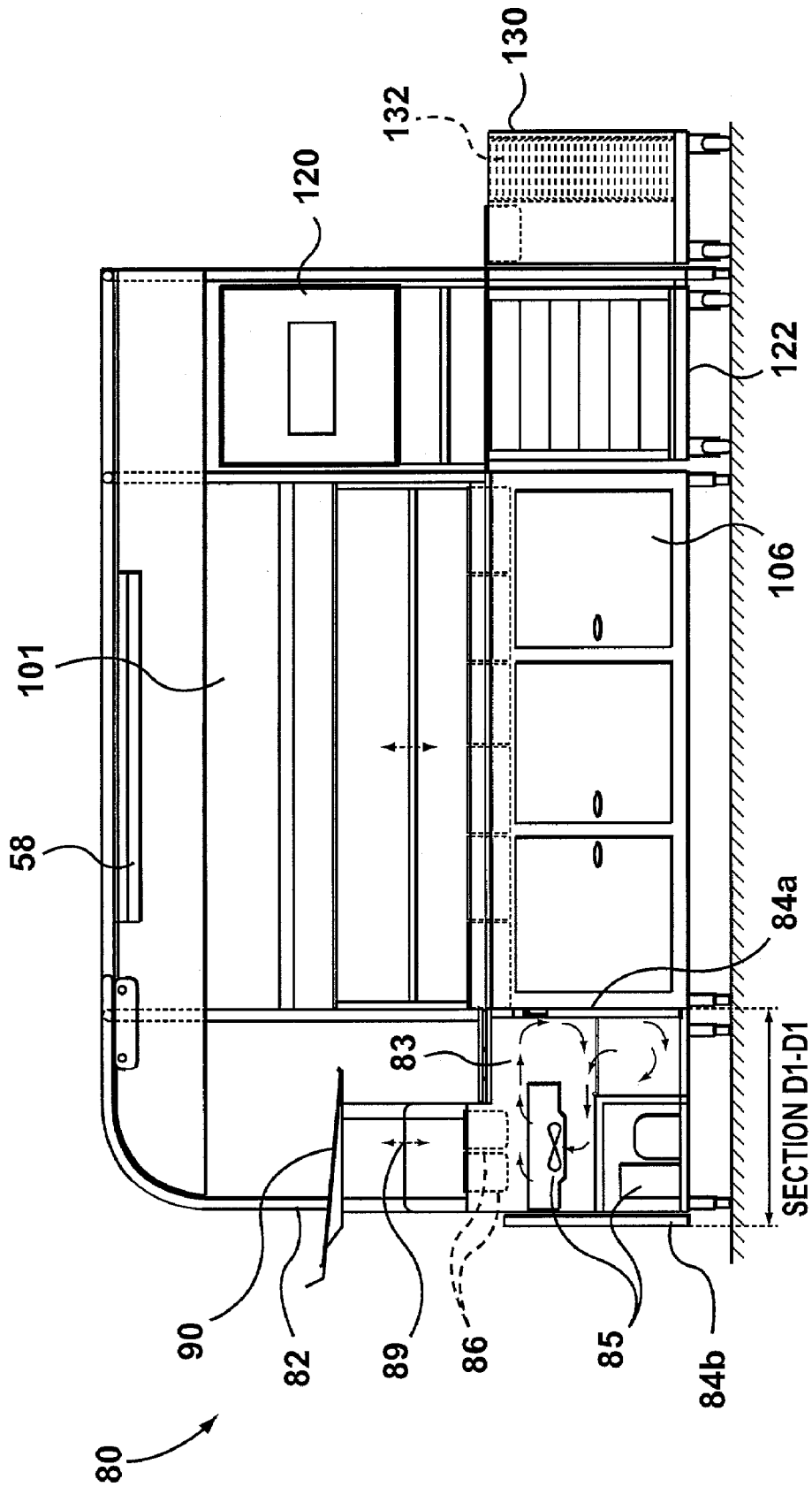


FIG. 7

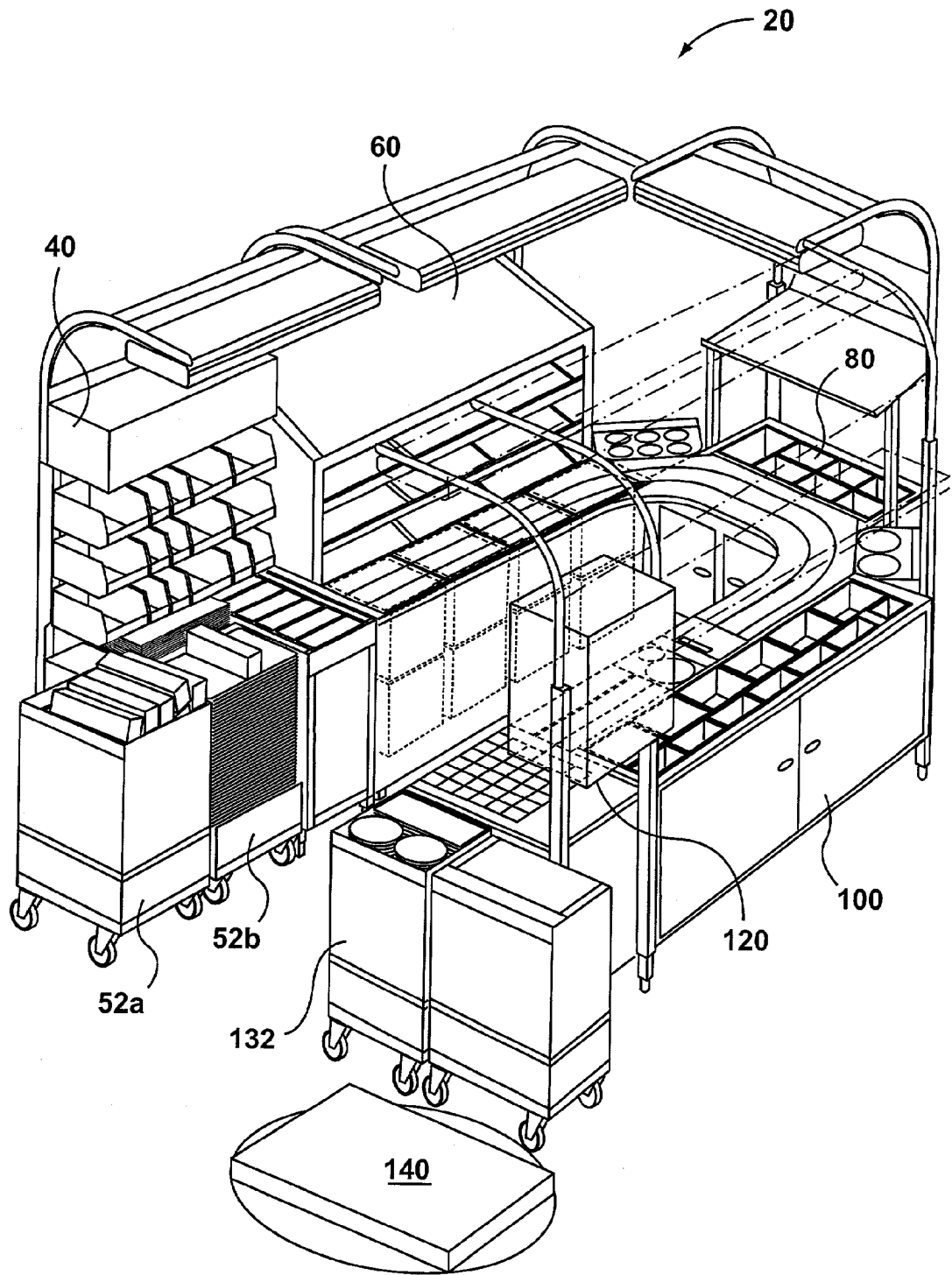


FIG. 8

SYSTEM AND METHOD FOR ASSEMBLING TRAYS AND FOOD ON TRAYS

FIELD OF THE INVENTION

[0001] This invention relates in general to a system and a method for assembly of trays, and more particularly to an ergonomic food and tray assembly layout for a single operator, for use in health care or other institutional setting.

BACKGROUND OF THE INVENTION

[0002] Many systems are known for preparing large quantities of trayed meals and like. A common example is the preparation of meals for airlines. These are usually carried by specialized catering companies, who supply fully replenished carts or trolleys directly to aircraft for use.

[0003] However, preparation of meals for airlines has some unique characteristics. At least for regular or economy meals, the total number of items is limited; for most items passengers are not given any choices, e.g. salads, desserts, etc. Commonly, passenger may be given a choice between two main dishes. These main dishes are often prepared and stored separately from the trays themselves, so they can be readily rethermalized, so that the basic tray layouts are all the same. Consequently preparation of such trays is readily achieved on a production line set up.

[0004] Preparation of meals in hospitals and institutional settings poses entirely different problems. Firstly, there may be a selection from as many as 35 to 40 items, giving many different combinations. All of these items must be stocked. Many such large institutions require meals or food to be prepared in large quantities and for this food to be individually delivered to many people. This commonly arises in hospitals and institutions for caring for elderly or chronically ill people. Traditionally, such institutions would have a kitchen on site and the meals would be prepared and immediately delivered from the kitchen by a cart to the patients. More recently and traditionally, for such institutions it has been recognized that there are advantages to preparing trayed meals or food in a more systematic way, using a local or external facility. Such external facilities often use an assembly line process, which increases the speed at which trays may be loaded. These assembly line facilities can typically provide loaded trays at a much higher rate than less systematized processes. However, assembly lines suffer from a number of disadvantages.

[0005] Patients in hospitals or residents of nursing homes often have specific dietary needs and wants. Thus, there is a need to customize each tray based on the dietary requirements of the person receiving the tray e.g. diabetic diet, liquid diet, etc. In an assembly process, it is often the case that no one individual has ownership, or is accountable, for each completely assembled tray as it is delivered to the patient. Where trays containing the wrong food or beverage items are delivered, it will be difficult to hold specific operators accountable, and thus difficult to correct the problem. Also, in such arrangements, the staffing requirements can be relatively high, leading to inefficiencies and low rates of productivity, due to constant imbalance of workload for each of the assembly line workers.

[0006] Accordingly, there is a need for a method and system for loading individual customized trays that is both

systematic and efficient, while enabling responsibility and accountability for each tray to be assigned.

SUMMARY OF THE INVENTION

[0007] In accordance with the first aspect of the present invention there is provided an improved tray assembly layout for loading food, condiments, wares, cutlery, and beverages (or at least some of these) onto a plurality of trays. The tray assembly layout comprises a plurality of stations for performing, for each tray in the plurality of trays, and a path of travel for an operator to follow to reach each station in the plurality of stations. The tray-loading method includes the steps of selecting a tray from the plurality of trays; and, loading the tray with food and beverages. The plurality of stations includes a first station for performing a first step in the tray-loading method and a last station for performing a last step in the tray-loading method. The path of travel extends alongside the plurality of stations, and includes a starting point adjoining the first station and an end point adjoining the last station. The starting point and the end point are adjacent such that an operator can quickly move from performing the last step of the tray-loading method on a tray at the last station to performing the first step of the tray-loading method on the next tray at the first station.

[0008] In accordance with the second aspect of the present invention there is provided an improved tray assembly method for loading food, condiments, wares, cutlery and beverages onto a plurality of trays. The method comprises the steps of, for each tray in the plurality of trays, performing a tray-loading method. The tray-loading method includes the steps of (a) selecting a tray from the plurality of trays, and (b) loading the tray with food and beverages. Each step in the tray-loading method is performed at a different station in a plurality of stations. A path of travel extends alongside the plurality of stations. The first step in the tray-loading method is executed at a first station in the plurality of stations. The path of travel includes a starting point adjoining the first station. The last step in the tray-loading method is executed at a last station in the plurality of stations. The path of travel includes an end point adjoining the last station. The end point and the starting point are adjacent such that an operator can quickly move from performing the last step of the tray-loading method on a tray at the last station to performing the first step of the tray-loading method on the next tray at the first station.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] For a better understanding of the present invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings which show a preferred embodiment of the present invention and in which:

[0010] FIG. 1 is a plan view of a system in accordance with the present invention;

[0011] FIG. 2 is an elevational sectional view along line DD of FIG. 1;

[0012] FIG. 3 is an elevational sectional view along line EE of FIG. 1;

[0013] FIG. 4 is a sectional view along line CC of FIG. 1;

[0014] FIG. 5 is a sectional view along line BB of FIG. 1;

[0015] FIG. 6 is a sectional view along line AA of FIG. 1;

[0016] FIG. 7 is an elevational sectional view along D1D1 of FIG. 1; and

[0017] FIG. 8 is a perspective view of the system of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The system as a whole is intended to provide an ergonomic environment or station, to enable a single operator, or possibly more than one operator as detailed below, to assemble a complete food tray. Such a system is primarily intended for use in health care and other institutional applications, for preparation of selected, individual menus. A prime characteristic of the system is to arrange all of the elements as ergonomically as possible. This then enables an operator to assemble an individual tray quickly, efficiently and accurately. Having a single operator assemble each tray is believed to lead to greater efficiencies, and a greater degree of accountability and pride.

[0019] Referring first to FIG. 1, this shows an overall plan view and the basic elements of the system. Thus, a basic configuration is a U-shape, and the overall system is indicated at 20. A generally U-shape ribbed counter 22 runs around the inside of the system, and defines a path for a tray, and the ribbed counter 22 has a start end 24 and a finish end 26. The ribbed counter 22 comprises a first straight part 28, a first corner part 29, an intermediate straight part 30, a second corner part 31, and a final straight part 32.

[0020] Together, the first straight part 28 and final straight part 32 define a path of travel 21. The path of travel 21 runs between and roughly parallel to the first straight part 28 and final straight part 32, first toward the intermediate straight part 30 and then back away from the intermediate straight part 30. The first straight part 28 and final straight part 32 would typically be spaced about one meter apart, or in the range of 0.7 meters to 1.5 meters, to permit an operator to move easily between them and to minimize movement required to turn from one section to the other section.

[0021] Immediately adjacent the start end 24 of the counter 22, there is an ergonomic condiment section 40. Behind and adjacent the first straight part 28 of the ribbed counter 22, there is an ergonomic combination section 60, for dairy products, juice, desserts and bakery items. Behind the intermediate straight part 30, there is an ergonomic soup section 80. Similarly, behind the final straight part 32, there is an ergonomic entrée section 100. Finally, to one side and adjacent the finish end 26 of the counter 22, there is a beverage dispenser 120. These individual elements or sections of the overall system 20 will now be described, in turn, together with their associated components.

[0022] With reference to FIGS. 1 and 2, in known manner, the ergonomic condiment section 40 includes, a frame or stand 42. As best shown in FIG. 6, this includes a vertical rear panel or frame, on which are hung a variety of condiment bins 46. In known manner, these condiment bins can have a variety of sizes. Details of typical bin sizes are given

below. Immediately below the bins, there is a work surface 48 on which is placed a stack of tray liners indicated at 49. To one side, as part of the stand 42, there is a series of compartments for holding cutlery, indicated at 51. Typically, it is expected that cutlery will be provided presorted, e.g. knives, forks and spoons, for a chosen menu (for example, a soup spoon may or may not be required).

[0023] Two mobile carts are provided, there being one cart 52b for trays indicated at 50. Another cart 52a is provided for dividers 54, the purpose of which is explained below. The cart 52a for dividers is simply in the form of an open bin, and an operator simply reaches into the cart to select a divider 54. For the cart 52b, this is provided with a lowerator, so that the top most tray 50 of a stack of trays on the cart 52b is always approximately at the same ergonomic work height.

[0024] In use, an operator stands at the position indicated at 56 in FIG. 1, selects a tray liner 49 and places it on the tray 50. A divider 54 is then taken and placed in the middle of the tray, as shown in FIG. 1. The operator then selects desired condiments from the condiment bins 46 and cutlery from the cutlery compartments 51. Depending upon the requirements of a particular operation, each of these selections can either be on the basis of a standard, set selection, or can be in accordance with choices indicated on a menu ticket. The operator would first select a menu ticket, to determine what items to select for the particular customized tray.

[0025] The operator with the tray 50 then moves across to the first straight part 28 of the ribbed counter 22. Behind this section, there is the combination section 60, shown in the elevational view of FIG. 2, and also in section, in FIGS. 4 and 5. This combination section 60 has a main framework 61 and is accessible from the rear through doors 62, as shown in FIG. 1. As shown in the sectional views of FIGS. 4 and 5, the combination section 60 includes various conventional elements of a refrigeration unit, such as a compressor 64, circulation fan 65 and the like.

[0026] The bottom part of the framework 61 defines a bottom compartment 66 for storage of crates for containers of milk types, juices and similar beverages. As shown, these crates indicated at 67 can be stacked and are accessible by providing a hinged open grate work top, in section 66a, for the straight part 28 of the counter 22. The grates have rails forming part of the ribbed counter 22. This enables an operator, with the tray in one location, to reach through the open rail grate in an ergonomic fashion, to extract a refrigerated carton of milk or juice as required. The grates are hinged either at the front or the rear as desired, for loading the milk and juice crates.

[0027] The upper part of the framework 61 includes a plurality of inclined shelves 69 for pans or containers of desserts, baked goods and the like, is a refrigerated section. Refrigerated air from the base of the main framework 61 is directed through the inclined shelves and returns through the open grates, indicated in FIG. 4.

[0028] Various sections of the system are provided with suitable lighting, such as fluorescent fixture, task lighting with a vapor proof acrylic lens, as indicated at 58. Also, as indicated at 59, a communication operation and food safety board is provided, which can give standard safety and, hygiene or instructional information to an operator.

[0029] The rear of stand **42** can be provided with various access doors, e.g. one or more bottom service doors with vent louvers for ventilation for a compressor coil, and one or more upper, insulated service doors, for sanitation and access. Where desired, front access doors can be provided. This configuration of doors applies generally to all the sections.

[0030] Accordingly, in use, an operator reaches through one of the open grate sections **66a** to select a desired drink and places it on the tray **50**. The operator can then select desired baked goods and desserts from the inclined shelves **69**. It will be understood that the order in which the operator carries out these two operations is not, usually, significant.

[0031] The operator with the tray **50** then moves around to the first corner part **29**. Behind the corner part **29**, there is a mobile or wheeled soup bowl lowerator **81**. Accordingly, if the menu ticket indicates that soup is desired, the operator takes a soup bowl and places it on the tray **50**.

[0032] The operator then moves with the tray **50** to the intermediate straight part **30**, in front of the ergonomic soup section **80**. This soup section **80** has a framework **82**. Again, the base of the framework **82** defines a compartment **83** with rear access doors **84a**, refrigeration equipment indicated generally at **85**, and front access doors **84b**. The intermediate straight part **30** runs across the front of the soup section **80**. At the rear of the soup section **80**, there are numerous soup containers **86** which can have different sizes and dimensions, as detailed below. In general, it is possible to anticipate what the demand will be for different soups, and provide greater quantities of soups that will be more popular and smaller quantities of the less popular soups. A counter weighted stainless steel protective cover **88** is provided. During the operator's coffee and lunch breaks or set up time, this can be lowered, to protect the soup. Immediately above the soup containers **86**, there is a rack **90** for supplements, e.g. packets of crackers and the like, commonly consumed with soup.

[0033] Thus, in use, having already placed a soup bowl on the tray **50**, the operator would select the desired soup, fill the bowl, and select appropriate supplements from the top rack **90**. The operator then moves around to the second corner part **31**, the outside of which is a mobile plate lowerator **98**. A plate is taken from the lowerator **98** and placed on the tray **50**.

[0034] The operator then moves to the ergonomic entrée section **100**. Like other sections, this includes a framework **101** defining a lower compartment **102** in which is housed conventional refrigeration equipment again indicated schematically at **103**. The refrigeration equipment **103** serves to circulate air to keep chilled a plurality of entrée dishes **104** containing various entrée items. These dishes can have a variety of sizes and shapes, as detailed below. Above the entrée dishes **104**, there is a shelf **105** for specialty items.

[0035] The compartment **102** is accessible from the front through doors **106**. Rear access doors can also be provided. Like the soup section **80**, the entrée section **100** includes a cover that can be lowered to protect the entrees, during operator breaks, etc.

[0036] Thus, in use, an operator would select desired entrée items, as checked off on a menu ticket, and place these on the previously selected plate. If any specialty items

are required, e.g. items that go with particular entrees, these would be selected from the shelf **105** and also placed on the tray.

[0037] Finally, at the end of the counter **22** there is the beverage dispenser **120**, for dispensing hot beverages. A wheeled cart **122** is provided for cups and a cart **122** with a supply of clean cups is provided at the front of the dispenser **120**. Accordingly, when a menu ticket requests an appropriate beverage, the operator selects a cup, fills the cup from the beverage dispenser **120** and places the cup on the tray **50**.

[0038] Beside the beverage dispenser **120** there is a mobile cart **130** for protective covers. This cart **130** includes plate covers indicated at **132** on a lowerator. A bin or slot **134** is provided for beverage covers. Accordingly, the operator selects required beverage covers and plate covers and places these on the items on the tray **50**, with separate soup covers being provided for the soup bowls.

[0039] Adjacent the mobile cart **130**, there is an ergonomic swivel lift **140**. This enables carts for completed trays to be loaded in an efficient and ergonomic manner, for non-pass through types of carts. Thus, the cart would be placed on the swivel lift **140** and raised to a height somewhere between waist and shoulder height of the operator. This enables the operator to take each completed tray and slide it into a slot in the cart. Such carts typically have a first series of slots accessible from one end of the cart and a second series of slots accessible from the other end of the cart. Thus, once one end of the cart has been filled, the lift **140** enables it to be rotated through 180°, for the second or other end of the cart to be loaded with trays. However, some carts may permit loading from one end, so that this rotation operation is not required, and standard non-swivel left can then be used.

[0040] Once the operator has loaded a full tray onto the cart, the operator merely turns around to start loading a new tray, due to the swivel lift **140** being located directly across the path of travel **21** from the start end **24** of the counter **22**.

[0041] It will be noted that the arrangement of the various carts for supplying wares and the like is carefully configured, to enable ready replacement of these carts without interrupting the operator. Thus, the carts **52a**, **52b** for the trays and dividers, the wheeled soup bowl lowerator **81**, the mobile plate lowerator **98** and the mobile cart **130** for the covers are all located so that they can be replaced or exchanged, without crossing the path of travel **21**. Thus, in use, this enables each of these movable wheeled carts and the like to be replaced, while an operator continues to perform the usual tasks in the usual order. This is achieved by providing these various components either on the side of the counter **22** opposite from the path of travel, or at the ends of the counter, i.e. the first and last station. It will also be noted that many of the sections **40**, **60**, **80** and **100** can be replenished with food or condiment items, largely without interrupting the operator.

[0042] The tray adjacent the ergonomic entrée section **100** is indicated at **50a** in FIG. 1. This tray **50a** shows typical layouts of the elements on the tray. Thus, the divider **54** is located in the middle of the tray, separating a hot side of the tray from a cold side of the tray. Foods that are to be served hot or warm are placed on the hot side of the tray, as indicated for the entrée plate **72** and the soup bowl **74**. On

the cold side of the tray, cold beverages, desserts (to be served cold), baked goods, cutlery and the like are placed. In use, in the carts intended for use with these types of trays, the divider **54** serves to separate the two sides of the tray, in the manner permitting passage of different air flows over the two sides of the tray. Thus, heated air can be passed over the hot side of the tray, to heat the food thereon immediately before serving. At the same time, cold air can be passed over the cold side of the tray, to maintain foodstuffs on that side of the tray cold. It will thus be understood that all the food placed on the tray at the system or station **20** is initially placed on in a cold condition, to ensure that the food remains in an optimum condition and to minimize bacterial growth and the like. The food to be served hot is then only rethermalised prior to serving in a separate delivery system.

[0043] The standard condiment bins **46** are of two sizes. Specifically, the bins **46a** as shown in **FIG. 2** are generally 4 and ½ inches wide by 4 and ½ inches deep and have a length of 11 inches. An alternative condiment bin **46b** is also 4 and ¼ inches deep, but has a width and length that are both 11 inches.

[0044] Typically, the soup containers **86** and entrée containers **104**, both shown in **FIG. 1**, are either 6, 9 or 14 cm deep.

[0045] Other variations and modifications of the invention are possible. For example, while the present invention has been described above as implemented in an institutional setting, such as a hospital or a nursing home, it will be appreciated by those skilled in the art that the invention may be usefully applied in other contexts in which a single operator loads a plurality of trays. Such modifications or variations are believed to be within the sphere and scope of the invention as defined by the claims appended hereto.

[0046] It is also possible that the system of the present invention would be used by more than one operator. The operator essentially travels in a circular manner around the path **21**, so two, or possibly more, operators could simultaneously travel around the path **21**, with their operations being staggered. For this purpose, it would likely be necessary to reconfigure the apparatus to increase the width between the two sides of the path **21**.

1. A tray assembly system for loading food and beverages onto a plurality of trays, the system comprising:

a plurality of stations for performing, for each tray in the plurality of trays, a tray-loading method including the steps of:

selecting a tray from the plurality of trays; and,

loading the tray with required food, condiments, wares, cutlery and beverages to form a customized tray,

the plurality of stations including a first station for performing a first step in the tray-loading method and a last station for performing a last step in the tray-loading method; and

a path of travel for an operator to follow to reach each station in the plurality of stations, wherein the path of travel extends alongside the plurality of stations, and includes a starting point adjoining the first station and an end point adjoining the last station;

wherein the starting point and the end point are adjacent such that an operator can quickly move from performing the last step of the tray-loading method on a tray at the last station to performing the first step of the tray-loading method on the next tray at the first station.

2. The system as defined in claim 1 wherein the system includes first, second and third sections, providing the plurality of stations, the first section is substantially parallel to the third section, and the second section extends from the first section to the third section; and,

the path of travel extends from the first section through the second section to the third section.

3. The system as defined in claim 2 wherein

the first section has an associated first end and an associated second end,

the third section has an associated first end and an associated second end,

the second section extends between the associated second ends of the first and third sections;

the first station is at the associated first end of the first section; and,

the last station is at the associated first end of the third section.

4. The system as defined in claim 3 wherein the spacing between the first section and the third section is in the range 0.7 meters to 1.5 meters.

5. The system as defined in claim 3 wherein the spacing between the first station is a tray station for providing a plurality of trays and the last station is a cart-loading station for loading the plurality of trays onto the cart such that after loading a tray onto the cart at the cart-loading station, the operator can turn around to take the next tray from the tray station.

6. The system as defined in claim 5 wherein the plurality of stations includes

at least one ware station for providing at least one ware to be loaded on each tray in the plurality of trays, and

at least one food station for providing food to be loaded in the at least one ware on each tray in the plurality of trays.

7. The system as defined in claim 6 wherein each ware station is movably mounted for removal from the plurality of stations and for replacement with a new ware station such that the ware station is removable and replaceable when empty.

8. The system as defined in claim 7 wherein

the plurality of stations have an inner side facing the path of travel, and an outer side facing away from the path of travel; and

at least one ware station is removable and replaceable from the outer side to avoid obstruction of the path of travel.

9. The system as defined in claim 8 wherein the first station and the last station are on different sides of the path of travel such that after performing the last step in the tray-loading method on a tray at the last station, the operator can turn around to perform the first step in the tray-loading method on the next tray at the first station.

10. The system as claimed in claim 9, which includes a counter, for sliding movement of trays, extending along the path of travel from the first station to the last station.

11. The system as claimed in claim 10, which includes at the start end, a condiment section for dispensing condiments, and providing space to accommodate at least one movable cart for trays.

12. The system as claimed in claim 11, wherein the condiment section includes space to accommodate a movable cart for trays and a movable cart for dividers.

13. The system as claimed in claim 12, wherein the first section includes shelving for presenting at least one of dessert items and bakery items, and includes a bottom part for storing beverages.

14. The system as claimed in claim 13, wherein the bottom part of the first section is refrigerated and wherein the counter includes a straight part extending across the front of the first section and including open grates, permitting access to the bottom part.

15. The system as claimed in claim 14, wherein the second section includes a refrigerated bottom part, for holding soup containers, and wherein between the first and second sections, at the rear of the counter, space is provided for a wheeled cart for holding soup bowls.

16. The system as claimed in claim 15, wherein the third section comprises an entrée section having a refrigerated base and providing a plurality of containers for holding entrée items, and wherein, between the second and third sections, there is provided a space at the rear of the counter, for a wheeled cart for holding wares for entrées.

17. The system as claimed in claim 16, including a beverage dispenser provided adjacent the third section and a space for a movable cart for covers for wares, for providing each tray with any required beverage and covers for filled wares.

18. The system as claimed in claim 7, wherein each ware station includes a lowerator for a stack of wares, for maintaining an uppermost ware of the stack at a substantially constant height.

19. The system as claimed in claim 16, wherein at least one of the second and third section includes a movable cover for covering and protecting food, during breaks in operation.

20. A tray assembly system for loading food and beverages onto a plurality of trays, the system comprising:

a plurality of stations for performing, for each tray in the plurality of trays, a tri-loading method including the steps of:

selecting a tray from the plurality of trays; and

loading the tray with required food, condiments, wares, cutlery, beverages, to form a customized tray, the plurality of stations including a first station for performing a first step in the tray-loading method and a last station for performing the last step in the tray-loading method;

a path of travel for an operator to follow to reach each station in the plurality of stations, wherein the path of travel extends along one side of the plurality of stations, and includes a starting point adjacent the first station and an end point adjacent the last station;

wherein the system includes a plurality of carts for wares, each cart being located at one of the other side of the stations and adjacent one of the first and last stations,

whereby each cart can be removed and replaced without crossing the path of travel, whereby, in use, each cart can be replaced to replenish the supply of wares without interrupting an operator.

21. A station, for use in assembling trayed food, the station comprising:

a framework defining a bottom compartment for storing food products;

along at least the front of the station, at least one grate providing a surface for supporting a tray and for providing openings for access to the bottom compartment, to enable an operator to reach through the grate to select food items from the bottom compartment.

22. The system as claimed in claim 21, wherein the bottom compartment includes lowerators for supporting containers for food items, and wherein hinge grates are provided, for providing access to the bottom compartment to replace the food containers.

23. The system as claimed in claim 22, wherein the station includes shelving above the bottom compartment for presenting additional food items for selection, and a refrigeration system for circulating chilled air through the bottom compartment and over the shelves, the air returning through the grates.

24. A tray assembly method for loading food and beverages onto a plurality of trays, the method comprising, for each tray in the plurality of trays, performing a tray-loading method including the steps of

selecting a tray from the plurality of trays, and

loading the tray with required food, condiments, wares, cutlery and beverages to form a customized tray; wherein

each step in the tray-loading method is performed at a different station in a plurality of stations,

a path of travel extends alongside the plurality of stations;

the first step in the tray-loading method is executed at a first station in the plurality of stations;

the path of travel includes a starting point adjoining the first station;

the last step in the tray-loading method is executed at a last station in the plurality of stations;

the path of travel includes an end point adjoining the last station; and,

the end point and the starting point are adjacent such that an operator can quickly move from performing the last step of the tray-loading method on a tray at the last station to performing the first step of the tray-loading method on the next tray at the first station.

25. The method as defined in claim 24 wherein each step in the tray-loading method is performed by a single operator.

26. The method as defined in claim 25 wherein

the first step in the tray-loading method comprises selecting a tray from a tray station; and

the last step in the tray-loading method comprises loading the tray onto a cart,

such that after loading a tray onto the cart at the cart-loading station, the operator can turn around to take the next tray from the tray station.

27. The method as defined in claim 26 wherein

the plurality of stations includes

a ware station for providing at least one ware to be loaded on each tray in the plurality of trays, and

a food station for providing food to be loaded in the at least one ware on each tray in the plurality of trays; and,

the tray-loading method further includes the step of loading the at least one ware onto the tray.

28. The method as defined in claim 27 further comprising, when the ware station is empty, replacing the ware station with a new ware station, wherein the ware station is movably mounted for removal from the plurality of stations and for replacement with the new ware station.

29. The method as defined in claim 28 wherein

the plurality of stations have an inner side facing the path of travel, and an outer side facing away from the path of travel; and

the ware station is removable and replaceable from the outer side to avoid obstruction of the path of travel.

* * * * *