SUPERVISORY AND CONTROL SYSTEM FOR FOOD-HANDLING INSTITUTIONS

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8 Claims, 10 Drawing Figures

A system is provided for supervising and controlling the preparation of foods and related activities in a food-handling institution. The system includes a console that provides visual and audible communication with selected remote points in the food-handling institution. The system also includes a conveyor for transporting food and other articles under the control of the console or an operator at the conveyor.
SUPERVISORY AND CONTROL SYSTEM FOR FOOD-HANDLING INSTITUTIONS

BACKGROUND OF THE INVENTION

Our invention relates to a supervisory and control system, and particularly to such a system for food-handling institutions such as a hospital kitchen.

In a food-handling institution such as a hospital kitchen a dietitian usually supervises the handling and preparation of food for the hospital patients. In such an institution, the quantity of food being prepared may be relatively large, and the variety and types of menus and diets being supplied may be extensive and varied. In order to provide high-quality food which is properly prepared and which satisfies the requirements of various diets, food-handling institutions have had to employ a relatively large number of people in the kitchen. Frequently, these people are unskilled in preparing and handling food, and require considerable training. And even after such training, a dietitian should or must exercise close or strict supervision and control over the food being prepared, particularly where the food is for a person who must adhere to a strict diet. Previously, where a variety of foods have been prepared for a variety of persons and types of diets, it was frequently necessary that a number of dietitians be employed to provide the proper supervision of the preparation of such foods. As in many skilled vocations, dietitians are relatively scarce and difficult to obtain or employ.

Accordingly, an object of our invention is to provide a supervisory and control system for food-handling institutions.

Another object of our invention is to provide a system having a central console with which a dietitian can supervise and control the preparation and handling of food at a number of remote locations.

Another object of our invention is to provide a supervisory and control system for use in food-handling institutions to provide means with which a single person can supervise and control a relatively large number of unskilled employees at remote locations.

Another object of our invention is to provide a supervisory system with which a dietitian can closely inspect the handling and preparation of food at a number of remote locations, and can communicate with people at these locations as to the handling of such food.

Another object of our invention is to provide a supervisory and control system having central voice and visual communication with a number of remote points at which food is handled or prepared to provide a dietitian with means for closely observing and supervising the preparation of food.

Another object of our invention is to provide a supervisory and control system for a dietitian.

SUMMARY OF THE INVENTION

Briefly, these and other objects are achieved in accordance with our invention by a control console which has visual communication means and audible communication means. The console visual and audible communications means may be selectively connected to one or more remote visual-sensing and audible communication means. A food conveyor is provided at a desired location in the food-handling area. One or more remote visual-sensing and audible communication means are positioned at one or more points along the conveyor. A first speed and direction control for the food-handling conveyor is provided at the conveyor, and a second speed and direction control for the conveyor is provided at the control console. The conveyor is normally controlled at the console, but may be controlled at the conveyor if desired. Thus, a skilled operator such as a dietitian, when provided with the console and its associated communication means and conveyor control, can supervise and control the handling of food by communicating with workers at remote locations and by controlling the operation of the conveyor.

BRIEF DESCRIPTION OF THE DRAWING

The subject matter which we regard as our invention is particularly pointed out and distinctly claimed in the claims. The structure and operation of our invention, together with further objects and advantages, may be better understood from the following description given in connection with the accompanying drawing, in which:

FIG. 1 shows a plan view of a typical food-handling institution which utilizes our invention;

FIG. 2 shows a perspective view of a food conveyor utilized in accordance with our invention;

FIG. 3 shows a perspective view of a control console in accordance with our invention;

FIGS. 4 and 5 show perspective views of a food-handling conveyor in accordance with our invention;

FIGS. 6, 7, and 8 show further views of our control console;

and FIG. 9 shows an electrical diagram of our control console and food-handling conveyor.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a plan view of a typical food-handling institution in a typical application such as a hospital having 100 beds. This institution may include an office 10, and a control room 12 adjacent to the office 10. The control room 12 contains a control console 14 in accordance with our invention. The control console 14 is connected to a number of remote communication locations or points indicated by the letters A through G. Each of the communication points includes an intercom for audible communication in both directions between the communication point and the control console. Each or selected ones of these communication points include visual-sensing means in the form of television camera tubes which scan the areas indicated, and provide signals to the control console 14.

The food-handling institution shown in FIG. 1 also includes a kitchen area 16 with food storage areas, counters, sinks, tables, stoves, and ovens. The kitchen 16 is provided with a communication point C2. Next to the kitchen is a walk-in storage area 18 which may include shelves for canned goods and the like, and which may also include refrigerators. The walk-in storage area is provided with a communication point C4. A dishwashing room 20 is provided, and this room 20 includes a storage area, tables, dishwashers, sinks, and means such as cans or disposables for garbage. The dishwashing room 20 is provided with a communication point C2. Food for the patients is assembled and made up in an assembly and makeup room 22. The room 22 includes a conveniently and strategically located conveyor 24. A dish storage area is provided at the head end of the conveyor 24 for clean dishes, trays, and utensils. Food carts are positioned along the sides of the conveyor 24 to enable workers to place food on the dishes. The assembly and makeup room 22 is provided with a communication point C1 which is positioned at the discharge end of the conveyor 24 to provide good communication and visual inspection of the finally prepared food on the conveyor 24. A second communication point C3 is also provided in the assembly and makeup room 22.

FIG. 2 shows a perspective view of the conveyor 24. FIG. 2 shows how the communication point C1 is located or positioned to provide good visual-sensing or scanning of the conveyor 24 and to provide audible communication between the communication point C1 and the control console 14. FIG. 3 shows a perspective view of a dietitian at the control console 14. In FIG. 3, it has been assumed that the dietitian has switched her console 14 to visual communication with communication point C1. The tray on the conveyor 24 of FIG. 2 is thus visually directed onto the television screen of the control console 14 of FIG. 3. The dietitian may also be in audible communication with the communication point C1, or be in audible communication with another communication point.
FIGS. 4 and 5 show perspective views of our conveyor 24. The conveyor 24 is shown as being mounted on wheels or rollers, but it is to be understood that the conveyor 24 may be permanently located. The conveyor 24 includes a moving endless belt 26 which is driven by a motor whose speed is variable. The motor is positioned adjacent to the head 28 of the conveyor 24. This electric motor is not visible in FIGS. 4 or 5, but typically may be a direct current motor whose speed and direction may be controlled at the conveyor 24. The speed is controlled by a speed control 30, and the direction of rotation of the motor is controlled by the position of a reversing switch 32. At the downstream or discharge end 34 of the conveyor 24, we provide a plate 36 which is hinged at its head or upstream end, and biased at an upward angle by an adjustable spring or similar device 38. When depressed by a tray or similar article, the plate 36 operates a stop switch 40 and a count switch 42.

When the stop switch 40 is operative in an electrical circuit, a tray or similar article moving on the belt 26 passes over the plate 36 and depresses the switch 40. The switch 40 opens an electrical circuit to the motor and stops the motor. The stop switch 40 is rendered operative or inoperative by the position of a selector switch 44. In one position, the selector switch 44 includes the stop switch 40 in the motor circuit; and in the other position, the selector switch 44 eliminates the stop switch 40 from the motor circuit so that the conveyor 24 continues to move despite a tray or article on the plate 36. Also, when the plate 36 is depressed, it operates the count switch 42 to close an electrical circuit to provide a count of the trays or articles which pass over the plate 36. An emergency stop switch 46 is provided for the conveyor 24 so that an operator may shut the switch 46 to stop the motor under any desired conditions. If the operator depresses the button 48 it may be depressed to provide a signal to the console 14. This signal can be used to provide an indication, an alarm, or a count of the fact that a tray has been rejected. The conveyor 24 shown in FIG. 4 is also provided with a number of additional intercom stations C1a and C1b which are positioned along the side of the conveyor 24 for audible communication between the dietician at the console 14 and the workers along the conveyor 24.

FIGS. 6, 7, and 8 show perspective views, front elevation, and side elevation views respectively of the console 14 in accordance with our invention. The console 14 is shown as being mounted on wheels or rollers, but it is to be understood that the console 14 may be mounted on a fixed platform. The console 14 comprises a rear panel in which a television picture tube 60 is mounted. The various television circuits are mounted within the console 14 behind the picture tube 60. A clock 62 is mounted near the top of the panel on the right of the picture tube 60. Two electrically operated counters 64, 66 are mounted beneath the clock 62. In a preferred embodiment, the counter 66 is used to count the number of trays rejected for a given meal or operation, and the counter 66 is used to count the number of trays prepared or passing over the plate 36 of the conveyor 24 for a given meal or operation. The counters 64, 66 may be provided with thumb wheels or other means for resetting these counters at the beginning of a new meal or operation. Two additional electrically operated counters 68, 70 are mounted on the rear panel on the left of the picture tube 60. In a preferred embodiment, the counters 68, 70 are used to provide accumulative or total count. Specifically, the counter 68 is used to count the total number of trays which have been rejected over a given operating period, and the counter 70 is used to provide a count or indication of the total number of trays which have been served or which have passed over the plate 36 of the conveyor 24. Beneath the counters 68, 70 is an hour meter 72 which can be used to show the number of hours that the conveyor 24 has been in operation. A master on-off switch 74 is positioned beneath the hour meter 72. The intercom controls are positioned beneath the television picture tube 60. These intercom controls include station selector switches 76, and one or more intercom transducers 78 which serve as speakers and microphones. The transducers 78 are connected to remote communication points by depressing one or more of the intercom selector switches 76.

On the front panel of the console 14, we provide a motorspeed control 70. The motor controls also include a direction switch 82 and an automatic stop or continuous operation selector switch 84. The speed control 80, the direction switch 82, and the selector switch 84 are similar to and perform the same functions as the speed control 30, the direction switch 32, and the selector switch 44 on the conveyor 24. At the left of the front panel, television selector switches 86 are mounted. These switches 86 connect the television picture tube 60 to a selected one of the communication points. Adjacent each of the switches 86 is a pilot light to indicate to the dietician or operator which communication point is being viewed on the television picture tube 60. A reject button 88 is placed on the front panel of the console 14 to provide an electrical signal if the dietician or operator sees a tray which should be rejected.

FIG. 9 shows an electrical diagram of the console 14 and the conveyor 24. Alternating current power for the system is provided through the main switch 74 to a power supply 75 for the conveyor motor 77. Since we prefer that the motor 77 be a direct current motor, the power supply 75 converts the alternating current to direct current. This direct current is supplied to the direction switch 82 which is a three-position switch having a forward contact, a transfer contact, and a reverse contact. When the switch 82 is connected to the forward or reverse contacts, the switch 32 is inoperative. The forward and reverse contacts are connected to the speed control 80 which in turn is connected to the selector switch 84. This selector switch 84 is a two-position switch having an automatic stop contact and a continuous contact. The automatic stop contact is connected through the tray-operated stop switch 40 and the emergency stop switch 46 to the motor 77. The continuous contact is directed connected through the emergency stop switch 46 to the motor 77. Thus, the motor 77 may be controlled from the console by positioning the switch 82 on the forward or reverse contacts, and controlling its speed by the speed control 80. The speed control 80 may be any suitable direct current speed-control circuit, such as phase-controlled rectifiers or similar circuits. If the selector switch 84 is connected to its automatic stop contact, power for the motor 77 is interrupted when a tray passes over the plate 36 of the conveyor 24 and on completion of the reverse operation of the selector switch 84 is connected to its continuous contact, the motor 77 receives power continuously, so that the conveyor continues to operate. In this case, the motor may only be stopped at the conveyor by the emergency stop switch 46. If the switch 82 is connected to its transfer contact, power from the power supply 75 is connected to the direction switch 32 in the conveyor 24 so that the switch 32 is inoperative. This switch 32 connects to either a forward or reverse contact, which in turn is connected to the speed control 30. The speed control 30 may be similar to the speed control 80. The speed control 30 is connected through the selector switch 44 to the motor 77 through the emergency stop switch 46 or through the tray-operated stop switch 40. Thus, the motor 77 and operation of the conveyor belt 26 may be controlled by a person at the console 24, if the operator at the console connects the switch 82 to the transfer contact. Otherwise, control of the conveyor 24 is kept at the console 14. The hours of operation meter 72 is connected to the line supplying power to the motor 77 so that this meter 72 operates and accumulates time as the motor 77 is operated.

The number of trays served is indicated by the counters 66, 70 which are supplied with a suitable signal or closure of a suitable circuit by the tray-operated count switch 42. Likewise, the number of rejected trays is counted or indicated by the counters 64, 68. If a person at the conveyor 24 sees a tray which, for some reason, should be rejected, the reject button 48 may be depressed to provide a signal or an electrical circuit which causes the counters 64, 68 to count or indicate a
rejected tray. Likewise, the console operator may depress the reject button 88 to provide a similar count. If desired, when the reject button 48 is operated, an alarm may be sounded at the console 14, but no count may be indicated in the counters 64, 68 at this time. Upon hearing this alarm, the console operator or diettian may, through the picture tube 60, inspect the tray. If the diettian decides that the tray should be rejected, she may depress her reject button 88 which supplies the count to the counters 64, 68 and which also cuts off the alarm. Or, if the diettian decides that the tray should not be rejected, she may operate other circuits (not shown) to turn off the alarm, without providing the additional count.

The television picture tube 60 may be connected to any one of a plurality of television pickup cameras at the various communication points by the television selector switches 86. Likewise, the console operator or diettian may make an audible connection to the communication points through the intercom selector switches 76. These switches 86, 76 have been shown as being rotary switches, but they may be the pushbutton-type switches shown in FIG. 6 or the toggle-type switches 86 shown in FIG. 6. The switches 86, 76 may be combined so that both the television picture tube 60 and the intercom 78 are connected to the same communication point through a single switch. A number of communication points may be connected to the intercom system at the same time. It is also possible to have more than one television picture tube 60, but we have only shown one such tube to keep the explanation of our invention relatively simple. It will thus be seen that our invention provides a new and improved system for permitting a diettian or single operator to supervise and control the preparation and handling of food at a number of remote points. Our system permits a single operator or diettian to view and inspect the operation, preparation, and handling of food at various points, and permits her to control a conveyor on which the prepared food is being moved. The diettian may communicate with people at remote communication points, and supervise or give instructions to people at these points. While we have shown our invention in only one embodiment, persons skilled in the art will appreciate that modifications may be made. For example, the number of communication points may be increased or decreased, and the number of television picture tubes may be increased. Likewise, various means may be added to provide other indications of the condition of the food or the condition of the conveyor. Therefore, while our invention has been described with reference to a particular embodiment, it is to be understood that modifications may be made without departing from the spirit of the invention or from the scope of the claims.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A system for supervising and controlling the handling of food in institutions, comprising:
   a. a food conveyor having a reversible drive motor therefor;
   b. first speed and direction controls for said drive motor associated with said conveyor;
   c. a control console having visual communication means and audible communication means;
   d. second speed and direction controls for said drive motor associated with said control console;
   e. means connecting said first and second speed and direction controls to said drive motor;
   f. means associated with said control console for selectively rendering one of said first and second speed and direction controls operative;
   g. a plurality of remote visual-sensing means and remote audible communication means;
   h. means at said control console for selectively connecting one remote visual-sensing means to said control console visual communication means;
   i. means independent of said last-named means and at said control console for selectively connecting one remote audible communication means to said control console audible communication means.

2. The system of claim 1 wherein said means for selectively rendering one of said first and second speed and direction controls operative comprises means positioned at said control console for rendering said first speed and direction control inoperative in response to said second speed and direction control being rendered operative.

3. The system of claim 1, and further comprising means associated with said conveyor for selectively and automatically stopping said drive motor in response to an article at the discharge end of said food conveyor.

4. A system for supervising and controlling the handling and processing of food in kitchens and like establishments, comprising:
   a. a central control station having television picture display means and intercom speaking apparatus;
   b. a plurality of remote communication points each having television camera means and intercom speaking apparatus;
   c. means connecting each of said communication points to said control station;
   d. means positioned at said control station for selectively independently connecting said television picture display means and said intercom speaking apparatus at said control station to at least one of said connecting means;
   e. conveyor means positioned at one of said remote communication points, said conveyor means having a variable speed and a reversible direction drive therefor;
   f. means at said one remote communication point for controlling the operation of said variable speed and reversible direction drive;
   g. and means at said control station connected to said control means at said one remote communication point for controlling the operation of said variable speed and reversible direction drive; said controlling means at said control station being operable to the exclusion of said controlling means at said one remote communication point.

5. The system of claim 4, and further comprising means at the discharge end of said conveyor means responsive to an article thereon, and means selectively connecting said article responsive means to said conveyor drive for stopping said conveyor drive in response to an article positioned on said article responsive means.

6. The system of claim 4, and further comprising means at said conveyor which can be actuated in response to the presence of an individual article on said conveyor, means connecting said actuable means to said control station, and indicating means at said control station connected to said last mentioned connecting means.

7. The system of claim 4, and further comprising means at the discharge end of said conveyor means responsive to the presence of an article, and means positioned at said control station and connected to said article responsive means for indicating the presence of an article at said article responsive means.

8. The system of claim 7, and comprising further means at said discharge end of said conveyor means responsive to the presence of an article, and means selectively connecting said further means to said conveyor drive for stopping said conveyor drive in response to the presence of an article at said further responsive means.