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(54) Title
A METHOD OF PREPARING AND DISTRIBUTING PORTIONED MEALS, PREFERABLY FOR USE IN AIR TRANSPORT

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(56) Prior Art Documents
US 3960290
FR 2128282

(57) Claim

1. A method of preparing and distributing portioned meals, preferably for use in air transport, comprising the steps of:

a) receiving raw materials from suppliers

b) preparing meals in portioned units, which are placed in service

c) making service and cutlery ready on trays

d) packing meal units in carts

e) transporting carts to aircraft

f) packing the soiled service in carts after the passengers of the aircraft have consumed the meals,

(11) AU-B-29218/95
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-2-

g) transporting the soiled service from the aircraft, removing the soiled service and cutlery from the carts and passing them on for washing-up in a dishwasher, characterized by

h) sorting the soiled service and cutlery immediately upon removal from the carts into units which correspond to ready and clean service, and

i) directly passing the soiled service to a dishwasher, and then

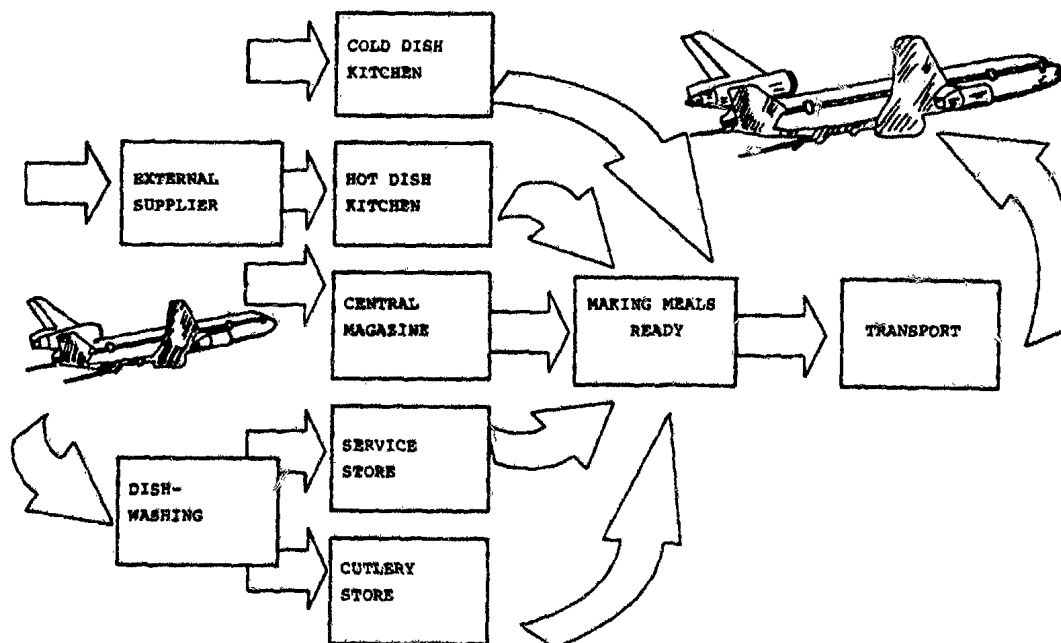
j) repeating steps a-g).



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(54) Title: A METHOD OF PREPARING AND DISTRIBUTING PORTIONED MEALS, PREFERABLY FOR USE IN AIR TRANSPORT



(57) Abstract

When making meals ready for air transport, soiled service and cutlery (24), when arriving in an airport, are sorted, cover-divided in baskets, for use for the next flight. The soiled service is sent into an industrial dishwasher, following which it is provided with food and packed in carts. Large amounts of storage space are saved in this manner in the individual airports, since the cycle time for storage of service and cutlery can be reduced from 26 hours to about 2 hours.



A method of preparing and distributing portioned meals, preferably for use in air transport.

The invention concerns a method of preparing and distributing portioned meals,
5 preferably for use in air transport.

As will be known, much transport today takes place by air. In connection with air transport, a meal is usually served, which may be composed rather differently according to which airline is in charge of the transport. Generally, however, some form of food is served on the vast majority of flights.

10 With the many daily flights it is huge amounts of meals that have to be prepared. It is therefore quite natural to try to rationalize all cycles of operations in connection with the preparation of air meals.

Fig. 1 shows a typical sequence in the preparation of meals in connection with flights. As will be seen in fig. 1, a kitchen for cold dishes and a kitchen for hot
15 dishes receive food products from external suppliers. When the food has been prepared, the meals are made ready, i.e. served on trays, including e.g. saucers, glasses, cups, cutlery, etc. When the meals have been made ready, they are placed in a trolley, hereinafter called a cart throughout this specification. The cart is driven out to the aircraft, and following departure the meals are served to the passengers.
20 Before the aircraft lands, all service and cutlery are col-



lected and again placed on a cart. Then the soiled service and cutlery are moved to an industrial dishwasher in which they are washed. After washing, service and cutlery are placed in a store, so the entire procedure can be repeated
5 again. As will be appreciated, a store is required in each air kitchen, and this store must be so large as to constantly have enough service and cutlery available for subsequent flights. Cutlery, service, cups and glasses are stored in the individual air kitchens in such a manner that
10 the store is divided according to each type of service for each individual airline. Further, it is not unusual for stores to have to be provided with a capacity of covering the needs for service and cutlery for about 26 hours, which is the cycle time from arrival to departure of service, and
15 with the many daily flights it will be appreciated that air kitchens must have very large stores of service and cutlery.

Accordingly, the object of the invention is to provide a
20 method of preparing and distributing portioned meals which saves storage space.

This object is achieved by a method of the type defined in the introductory portion of claim 1, more particularly by
25 comprising the steps of:

- a) receiving raw materials from suppliers
- b) preparing meals in portioned units which are placed in
30 service,
- c) making service and cutlery ready on trays
- d) packing meal units in carts
35
- e) transporting carts to aircraft

f) packing the soiled service in carts after the passengers of the aircraft have consumed the meals

- 5 g) transporting the soiled service back from the aircraft, removing service and cutlery from the carts and passing them on for washing-up in a dishwasher.

This method is characterized by

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h) sorting the soiled service and cutlery immediately upon removal from the carts into such units as correspond to the requirement for ready and clean service, and

- 15 i) directly passing the soiled service to the dishwasher, and then

j) repeating steps a-g.

- 20 When the method is performed in this manner, a very great storage space saving is obtained, since instead of a store for 26 hours, a store for about 2 hours now suffices, said 2 hours being the cycle time from arrival to departure.

- 25 In an advantageous embodiment of the method, a minor buffer store for the completion of service and cutlery is provided in step h).

This provides the advantage that where some service has
30 disappeared for one reason or another during transport, it is possible to supplement with new cutlery from the buffer store. Further, the buffer store is also advantageous, if other meals than those just arrived with the last aircraft have to be served.

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Additionally, the method is advantageous in that the soiled service, cutlery and trays are placed in baskets, which are adapted to receive at least a complete set of soiled service with cutlery and tray.

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This provides an extremely well-arranged cycle of operations, since trays, cutlery and service, when leaving the dishwasher, can be handled and made ready very quickly.

- 10 In an embodiment, the method is also advantageous in that, between steps i) and j), cutlery is packed in bags in cover units, or that the cutlery is packed by rolling-up in a napkin and is put back in the baskets.
- 15 Additionally, the method is advantageous in that, after wrapping of cutlery, service, cutlery and trays are removed from the baskets, and a napkin as well as cutlery, cups, glasses, salt and pepper and the like are placed on the tray, while the units to be provided with food are col-
- 20 lected in other baskets and are passed to a central location to be filled with food, and then the units provided with food are returned to the trays, which are then placed in carts.
- 25 This provides a very flexible organization of the work, it being noted that within a period of 2 hours from the arrival of the soiled service with the aircraft it is made ready on carts, after washing, and is ready for the flight. Finally, the method is advantageous in that the preparation
- 30 and distribution of the portioned meals are performed by means of several parallel dishwashers and with the steps defined in claims 1-6.

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When several parallel dishwashers are used, the work may be organized such that each parallel dishwasher serves a few, e.g. three to seven, airlines. This is a help to the opera-



tors, because the number of different tray accessories to be managed is then reduced.

The basket for use in the performance of the method is characterized in that the basket is divided into compartments, which correspond precisely to the reception of the contents of service to be washed from preferably one or two baskets.

- 5 The basket gives a clear cycle of operations for the staff, since service, cutlery and trays, already when leaving the dishwasher, are divided into portioned units with the things that are to be present on the next flight.

The basket is advantageously equipped with a lid that partly covers the basket.

- 10 This is an advantage in connection with the washing-up, since cups, which are usually used in aircraft, are light cups of plastics which do not turn while the machine washes.

Finally, it is advantageous that the bottom of basket is constructed for conveyance on conveyor belts.

- 15 The cutlery holder for use in the basket is characterized in that it is constructed as a ramp having at least two elevations, one of which terminates the ramp and merges into a horizontal member.

This cutlery holder is extremely expedient in connection with ready-making on a conveyor belt, where many baskets are to be filled and emptied, since the cutlery holder ensures rapid removal and positioning of cutlery from and in the baskets.



The invention will be explained more fully now in connection with an embodiment of the invention as shown in the drawing, in which:

5 fig. 1 shows a flow diagram of a known manner of preparing and distributing portioned meals, as already mentioned in the foregoing,

10 fig. 2 is an explanatory view of a dishwasher, with the various routines associated with it,

15 fig. 3 is a flow diagram of a complete system for preparing and distributing portioned meals according to the invention,

20 fig. 4 shows a basket for use in the performance of the invention,

25 fig. 5 shows a cutlery holder for use in the basket of fig. 4, and

30 fig. 6 shows how the baskets on a production line are packed.

35 Fig. 2 shows the lay-out of a kitchen for use when making meals ready. The kitchen is divided into three areas, where area I is the area where soiled service is received and sorted, area II is the actual dishwasher, and area III is the area where washed service is made ready. In area I, the soiled service from a flight is received in carts (i.e. trolleys) and is sorted in a special basket, which will be described in connection with fig. 4. Waste is discarded into a hole 2 near the sorting location 1. A buffer store 4 is provided at the sorting location 1, and this buffer store is used for completing and/or supplementing the cover units that are to be made now of soiled service. The buffer

store is arranged such that it has precisely the units that are to be used for the next flight. If the next flight is to have another composition of meals, the buffer store is provided with sufficient cutlery for this. The buffer store moreover has the advantage that it is now possible to check the amount of waste that might have occurred at the last flight. This is easily done, it being merely observed how much of the service from the buffer store is used in the making of the new covers. The waste can thus be measured merely by counting the buffer store before and after use. When the soiled service has been divided into portions, it is conveyed by a conveyor belt 5 into the area II, where it is washed up in a dishwasher 6. After washing-up, which takes place in a modified industrial dishwasher, the cleaned service arrives at the area III, the baskets arriving at an area 7 where the cleaned cutlery is wrapped in plastics sheet or placed on a napkin. The ready cutlery is put back where it came from in the basket, following which the basket is transported to the next area where service and cutlery are removed from the basket in such a manner that the service to be provided with food is placed in larger trays and is transported to a kitchen for cold dishes or a kitchen for hot dishes. The rest of the service, such as cutlery, cups, glasses, salt and pepper, etc., made ready on a tray, is conveyed on a conveyor belt further on to the location 10 where the saucers and bowls filled with food are put back on the tray. The ready trays are then packed in carts 11 and are now ready for the next flight. As will be appreciated, the transport of service and cutlery takes place on a belt provided with baskets that circulate in an endless path, the baskets being at no time removed from the belt that runs in the directions of the arrows shown in fig. 3.

Fig. 3 shows a flow diagram of the process in the ready-making of portioned meals according to the invention. It

will be seen to the left in fig. 3 that raw materials are supplied by external suppliers, said raw materials being transported to a production department where the food is prepared and portioned. Fig. 3 shows an assembly line consisting of three flow lines. These three flow lines separately correspond to the one shown in fig. 2. The three flow lines are constructed in the same manner and can each handle typically from three to seven different airlines. Thus, the assembly line shown in fig. 3 can typically serve up to 21 different airlines. The advantage of dividing it into several units is that the staff then just have to be attentive to the requirements of seven airlines with respect to the laying of trays. This minimizes possible errors, and simultaneously the smaller units have the effect on the staff operating the assembly line that they constitute a team who are jointly responsible for the operation proceeding as smoothly as possible. After the trays have been made ready, and they have been packed in carts, they are transported to out the external customers which are the various airlines. When the flight is over, the process is repeated, and when it is performed as described, the service just arrived at an airport can be sent off within a time interval of just 2 hours.

Fig. 4 shows a basket which is extremely expedient for use on the line of fig. 2. The figure shows that the basket has two insertable cutlery baskets 13 and two elongate compartments 14 for trays and some centrally located compartments 16 to receive saucers, glasses and cups. Fig. 4 additionally shows a lid 15 which may be placed over part of the tray. This is an advantage in particular concerning cups and glasses that are used in aircraft, since they are ordinarily of a light material, such as plastics, and are therefore generally susceptible to the washing jets of the dishwasher. In other words, the cups and the glasses might turn during the washing process, which, of course, is not

desirable since a further buffer store then has to be provided at the exit of the dishwasher. The lid 15 can thus retain the cups and the glasses in the correct positions during the entire washing sequence. As an alternative to
5 the lid 15, holding means in the form of pins 20 may be provided in the basket itself, said pins being capable of pivoting about the pivot 21. When light cups are placed in the basket, the pins hold the cups, which then do not topple about in the basket during washing.

10

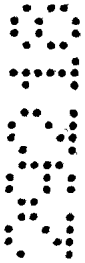
Fig. 5 shows a cutlery holder 22 which may be used instead of the cutlery basket 13. As will be seen from fig. 5, it is constructed as a ramp 25 having two elevations 23, one of which terminates the ramp and merges into a horizontal
15 member 26. When the cutlery 24 is placed on the elevations 23, it will be effectively washed on all faces in a dishwasher.

As will be seen, the basket in fig. 4 is designed for precisely two covers. This is extremely advantageous, since
20 the basket then lends itself for e.g. the serving of both luxurious meals, e.g. on long first class flights, and more modest meals on short flights, as the basket may then be used as a cover for first class preparation, while the basket
25 may contain two covers for somewhat shorter flights where the requirements with respect to the meals and thus the amount of service are not so great.

Finally, fig. 6 shows part of the air kitchen according to
30 the invention. A section is shown at a location where the cutlery has been made ready, and where saucers are sorted in bigger baskets 18 for conveyance to a cold dish kitchen or a hot dish kitchen to be filled with food. The rest of the contents of the basket, such as glasses, cups, salt,
35 pepper and a cloth on a tray, is conveyed by a conveyor belt 19 further on to a receiving station where the saucers

now filled are again placed on the tray, following which everything is placed in carts and is ready to be sent with the next flight.

It will be understood, unless the context requires otherwise, that the term "comprises" or its grammatical variants as used herein is equivalent to the term
5 "includes" and is not to be taken as excluding the presence of other elements or features.



DAB:RR:#24316.R31

17 July 1997

P a t e n t C l a i m s :

1. A method of preparing and distributing portioned meals,
5 preferably for use in air transport, comprising the steps
of:
- a) receiving raw materials from suppliers
 - 10 b) preparing meals in portioned units, which are placed in
service
 - c) making service and cutlery ready on trays
 - 15 d) packing meal units in carts
 - e) transporting carts to aircraft
 - f) packing the soiled service in carts after the passengers
20 of the aircraft have consumed the meals,
 - g) transporting the soiled service from the aircraft, re-
moving the soiled service and cutlery from the carts and
passing them on for washing-up in a dishwasher, c h a r -
25 a c t e r i z e d b y
 - h) sorting the soiled service and cutlery immediately upon
removal from the carts into units which correspond to ready
and clean service, and
 - 30 i) directly passing the soiled service to a dishwasher, and
then
 - j) repeating steps a-g).
 - 35
2. A method according to claim 1, c h a r a c t e r -

ized by providing a buffer store in step h) for the completion of service and cutlery.

3. A method according to claim 1 or 2, characterized by placing the soiled service, cutlery and trays in baskets with a lid which partly covers the baskets and a bottom which is adapted for conveyance on conveyor belts, said baskets being
5 divided into compartments which correspond precisely to the reception of the contents of service to be washed from preferably one or two baskets.

4. A method according to any one of claims 1-3, characterized in that the cutlery is placed on a cutlery holder having a ramp comprising at least two elevations, one of which terminates the ramp and merges into a horizontal member.

10 5. A method according to claim 3, characterized by packing the cutlery, between steps i) and j), in bags in cover units, or packing the cutlery by rolling-up in a napkin which is put back into the baskets.

6. A method according to claim 5, characterized by removing service, cutlery and trays from the baskets after wrapping of cutlery, placing on the tray a napkin,
15 cutlery, cups, glasses, salt and pepper and the like, while the units to be provided with food are collected in other baskets and passed on to a central location to be filled with food, and then returning the units filled with food to the trays, which are then placed in carts.

7. A method according to any one of the preceding claims, characterized by
20 performing the preparation and distribution of the portioned meals by means of several parallel dishwashers and with the steps which are defined in any one of claims 1-5.



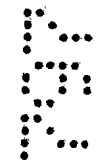
8. A method of preparing and distributing portioned meals, substantially as hereinbefore described with reference to the accompanying drawings.

DATED: 17 July 1997

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Patent Attorneys for the Applicant:

GATE GOURMET INTERNATIONAL AG



DAB:RR:#24316.RS1

17 July 1997

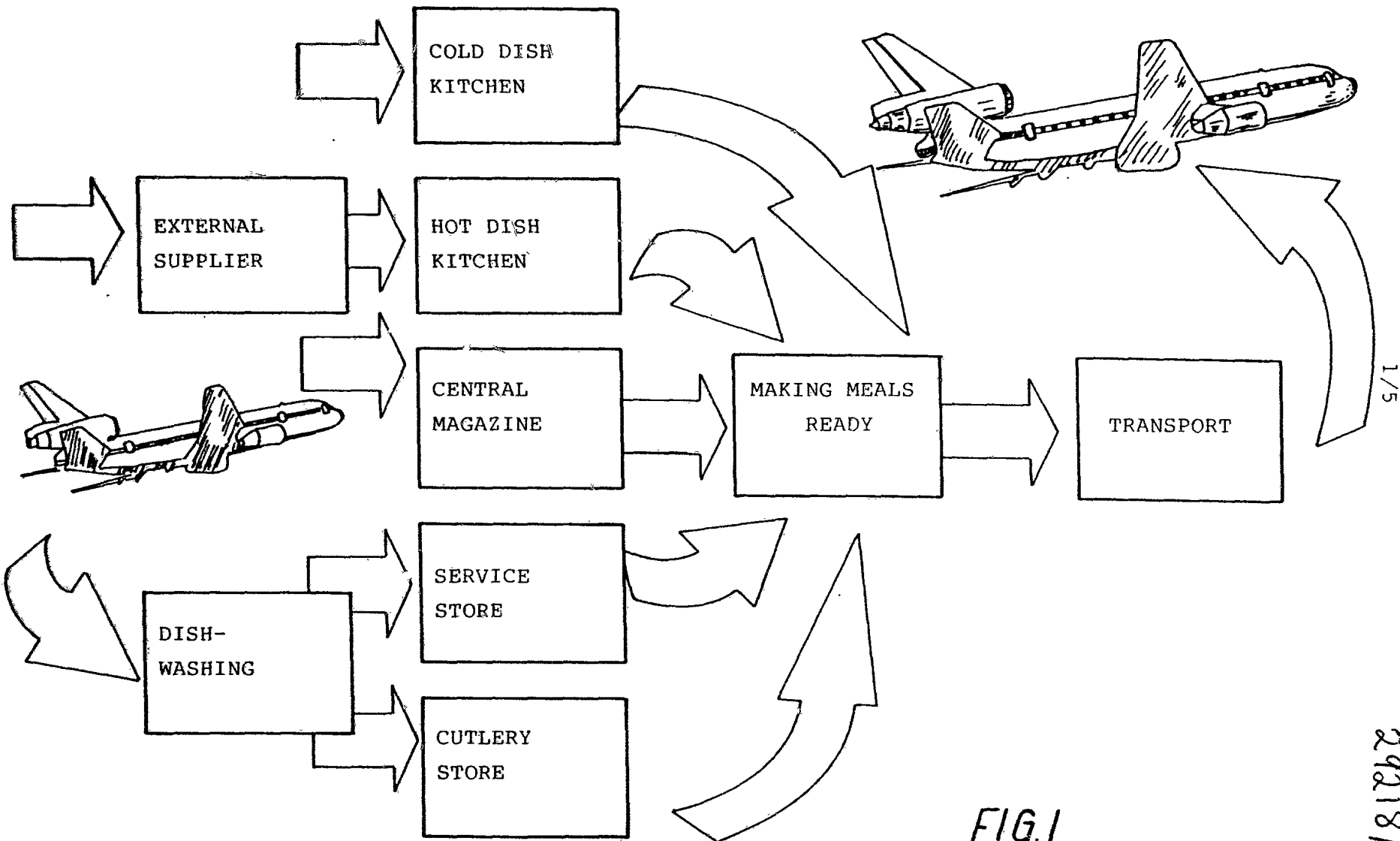


FIG.1

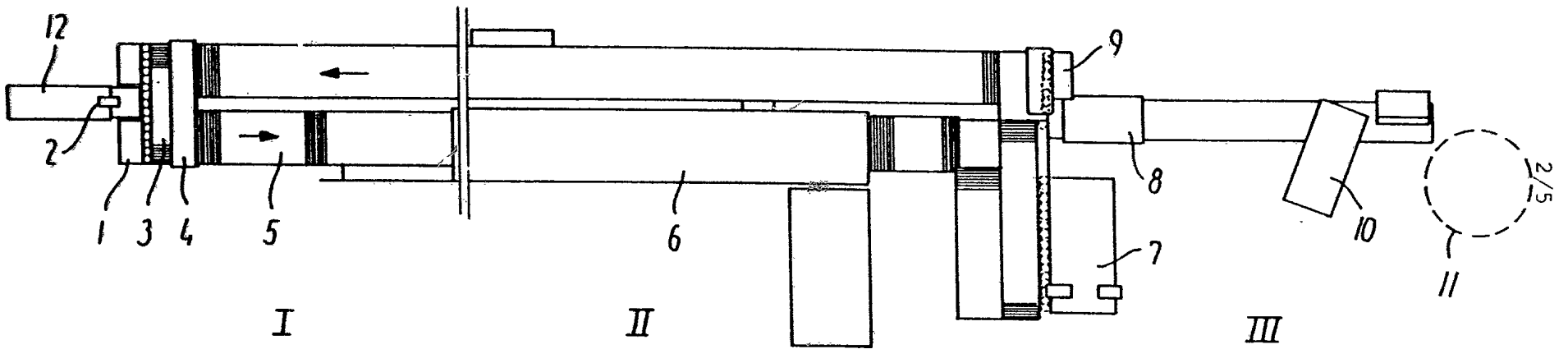


FIG. 2

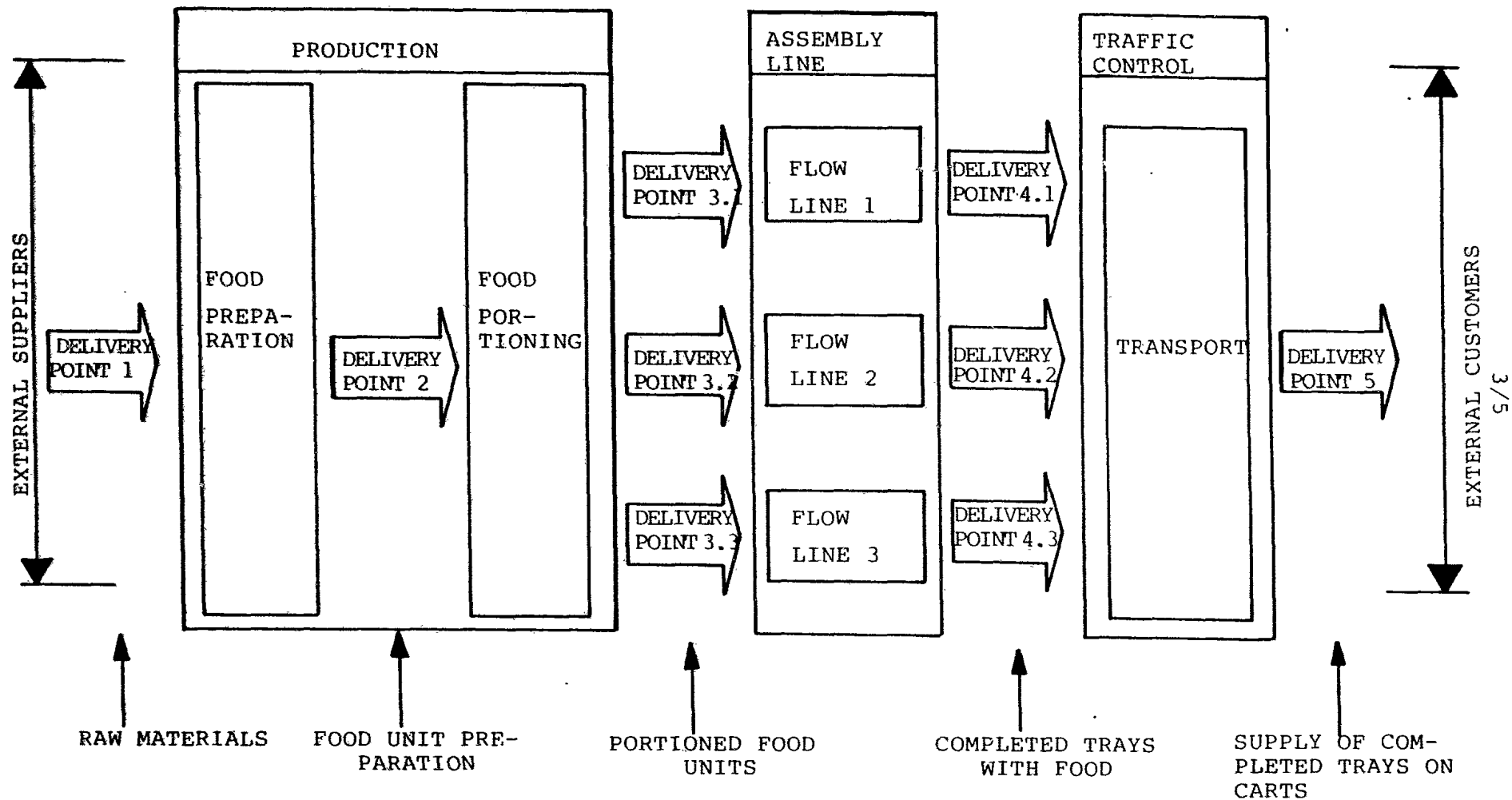


FIG.3

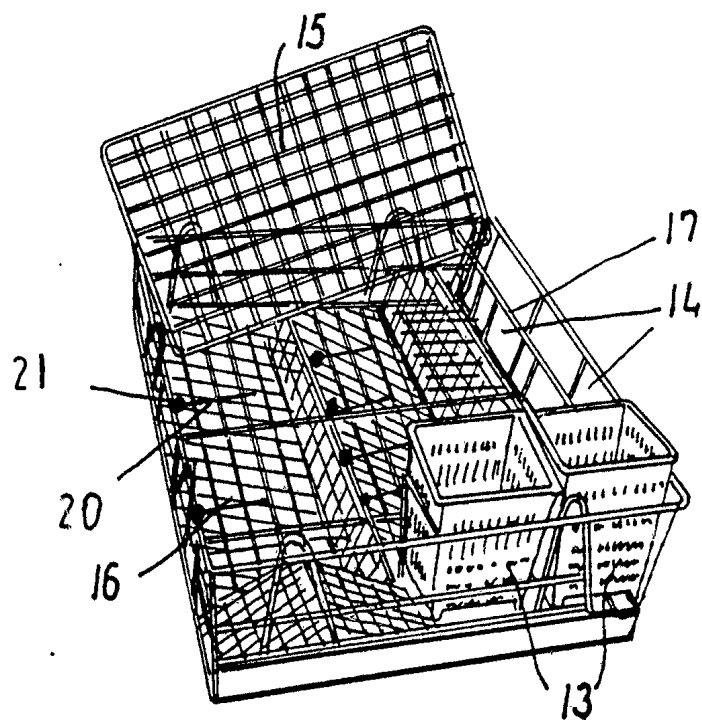


FIG. 4

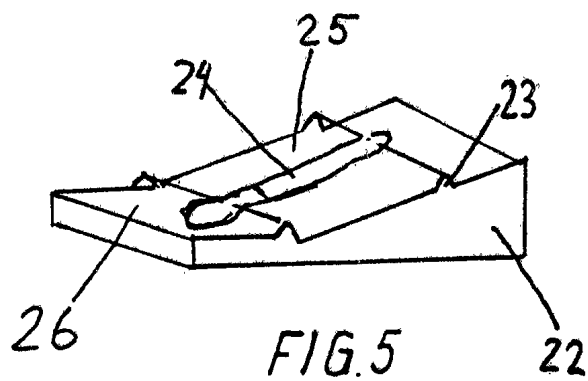


FIG. 5

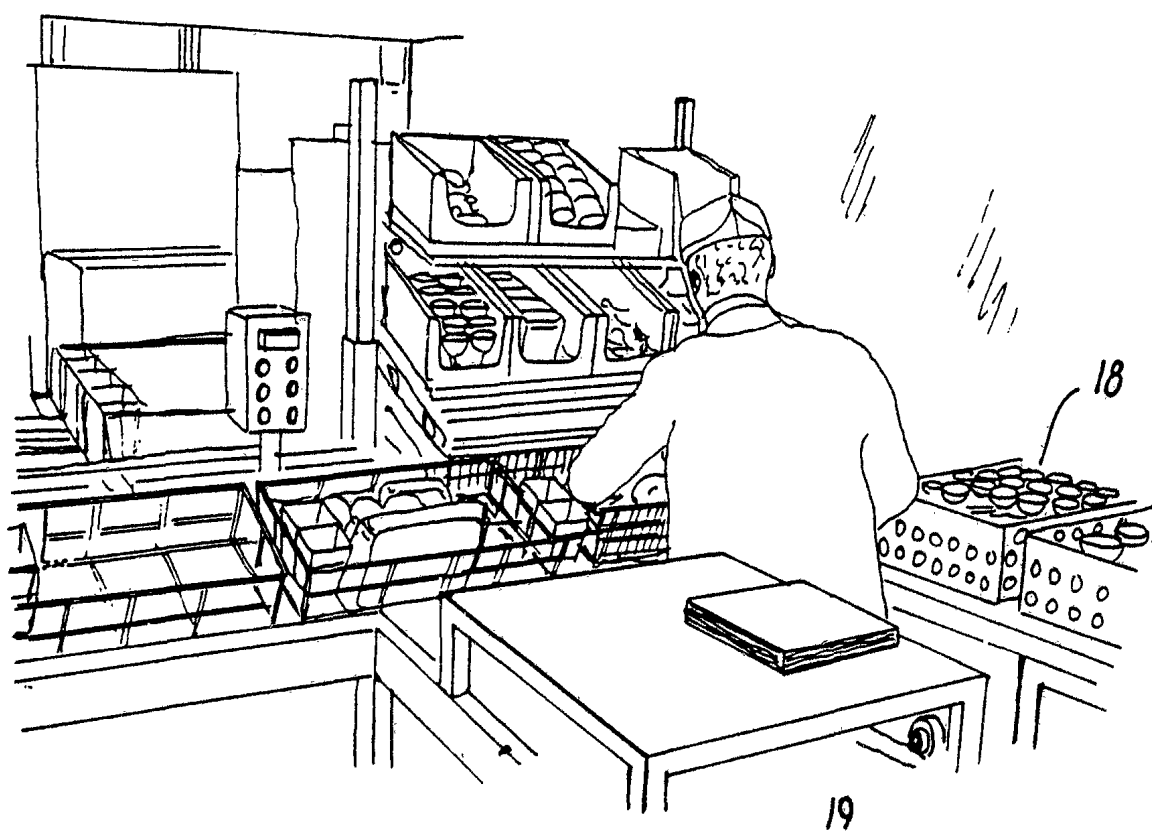


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 95/00299

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A47L 15/00, A23L 1/00

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)

IPC6: A47L

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

SE,DK,FI,NO classes as above

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

EPODOC, DIALOG

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database PTS New Product Announcements on Dialog PR Newswire, Eastern Airlines, (Atlanta, GA, USA), No. 0207327, "Eastern Airlines dedicates new Atlanta flight Kitchen", December 14, 1988, line 77 - line 97 --	1-6
X	US 3960290 A (W.H. YAKE ET AL), 1 June 1976 (01.06.76), column 3, line 25 - line 49; column 5, line 47 - line 53	7-8,10
Y	--	9
Y	DE 4339111 A1 (WINTERHALTER GASTRONOM GMBH), 19 May 1994 (19.05.94), column 4, line 68 - column 5, line 7	9

☒ Further documents are listed in the continuation of Box C.☒ 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

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

2 November 1995

Date of mailing of the international search report

07-11-1995

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 95/00299

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2128282 A (TERMOELETTRODOMESTICI SMEG S.A.S. DI BERTAZZONI VITTORIO & C.), 20 October 1972 (20.10.72) --	7-9
A	US 5201826 A (D.E. ZIMMERMANN), 13 April 1993 (13.04.93) --	7-9
A	DE 1403654 A (WILLRATH, DR. H.-H.), 17 October 1968 (17.10.68) --	9
A	WO 8904136 A1 (SEE, B.), 18 May 1989 (18.05.89) --	10
A	US 5086544 A (W. HUTTEMANN ET AL), 11 February 1992 (11.02.92) -- -----	10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 95/00299

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- I Claims 1-6 div. to a method of preparing and distributing portionel meals.
- II Claims 7-9 directed to a basket.
- III Claim 10 directed to a cutlery holder.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/10/95

International application No.

PCT/DK 95/00299

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	3960290	01/06/76	NONE		
DE-A1-	4339111	19/05/94	NONE		
FR-A-	2128282	20/10/72	NONE		
US-A-	5201826	13/04/93	NONE		
DE-A-	1403654	17/10/68	FR-A-	1287850	00/00/00
			GB-A-	974337	00/00/00
			IT-A-	649426	00/00/00
			US-A-	3122235	00/00/00
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			GB-A-	2220559	17/01/90
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			DE-A-	3721689	12/01/89
			EP-A,B-	0323496	12/07/89
			SE-T3-	0323496	
			JP-T-	1501689	15/06/89
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