

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 002 486 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.05.2000 Bulletin 2000/21

(51) Int. Cl.⁷: **A47F 10/06**

(21) Application number: **98122095.7**

(22) Date of filing: **21.11.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventors:
• **Host-Madsen, Knud**
2900 Hellerup (DK)
• **Schnellmann, Klaus**
8166 Niederweningen (CH)

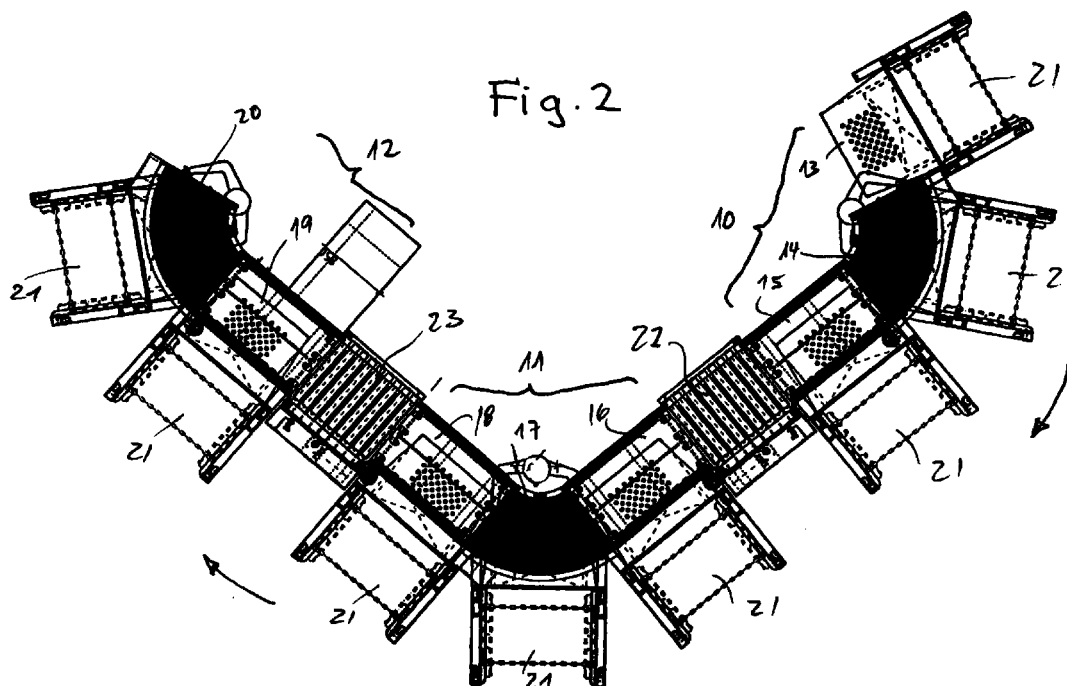
(71) Applicant:
GATE GOURMET INTERNATIONAL AG
8058 Zürich Airport (CH)

(74) Representative:
Troesch Scheidegger Werner AG
Patentanwälte,
Siewerdstrasse 95,
Postfach
8050 Zürich (CH)

(54) **Tray setting system**

(57) The tray setting system consists of feeding items to be placed on trays to a number of workplaces (13 - 20) interconnected by conveyors, operated each by an operator for manually placing items from appropriate carriers onto the trays (for a predetermined order, all

trays are charged with identical items). The carriers are brought in front of the workplaces (13 - 20) by carrier lifters (21) on the right height position for the operator.



EP 1 002 486 A1

Description

[0001] The present invention relates to a method of setting trays to be packed with items, such as food, particularly for airline catering and a tray setting system or installation for trays to be packed with items and food, specifically for carrying out the tray setting method.

[0002] Tray setting in airline catering on a big scale came up in the past years. The main problem consists in organising tray setting in a manner to be efficient with regard to speed and with regard to the individual need and wishes of the airlines, all this in fulfilling highest quality and hygienic demands.

[0003] In order to be very fast, attempts have been made for high automatisation.

[0004] Tray setting is only one part in the whole chain of preparing, portioning and distributing food with all necessary equipment, cleaning and washing reusable items, storing prepared items and transporting them from an aircraft to a handling centre and finally back to an aircraft.

[0005] It was an object of the present invention to develop an optimised tray setting system full-filling all requirements and being efficient, as part of the whole flow line.

[0006] In this respect the tray setting system as part of this flow line is interconnected between the clean side of the stripping line and finally the storing system before transporting the trays to aircraft's.

[0007] According to the present invention the object has been achieved by the tray setting method of claim 1 and particularly by the different steps defined in this claim.

[0008] Furthermore the object can be achieved by a tray setting system as defined in claim 2 with the features of the system as set out, particularly by the installation of a plurality of workplaces equipped with carrier lifters.

[0009] The invention will be more fully described with reference to the accompanying drawing in which:

Fig. 1 is a schematic view of a tray setting system incorporating the present invention, and

Fig. 2 is a top view at a larger scale of one workplace of the tray setting system.

[0010] In the tray setting system illustrated in Figure 1 the storing zones, the workplaces and finally the trolley lifter are positioned such, that all components are in optimised places for minimum travel of carriers (in parking zones) to the workplaces 1 - 3, of which each is equipped with three working tables A, B and C. The workplaces 1 - 3 are interconnected by conveyors (on the same height as the working tables). Buffer zones are arranged between workplaces 1 and 2 and between 2 and 3.

[0011] The parking areas may comprise zones in

normal environment and zones in cold environment (for storing food items) in which the different items to be set on the trays are stored in bins, baskets or open on grates in single and double stack carriers.

[0012] From there the carriers are fed manually to the feeding side of the tray setting system, to the carrier lifters by a person called feeder.

[0013] The carrier lifters 4 are used to destack (or stack) the carriers, so that now carriers are hanging in the carrier lifters ready to be used.

[0014] This allows the equipment to be brought to the correct height at each worktable A, B, C of the workplaces 1, 2, 3 without having to manually lift heavy components (only sliding in and out).

[0015] The front end of the carrier lifters are holding shelves on which the items in the bins and baskets can be slid out and be ready for the operators to take items and put on the trays (which are e.g. fed by carriers to table 2 of workplace 1).

[0016] The items are arranged in a semi circle (see Figure 2) to allow for ergonomic and fast handling of items.

[0017] Normally the tray setting system contains 3 workplaces for 3 operators (one workstation can be shortcut to reduce the system to two operators).

[0018] In front of the operators the conveyors are stopped for ease of working and better accuracy of setting items down (e.g. three working tables for each operator).

[0019] The first operator takes tray and traymat and puts it on the conveyor. Then he takes additional items like glass and cutlery and puts them on the trays. The tray is released and moved with the conveyors into a buffer 1 (up to 10 trays). Buffer 1 holds trays only if operator 2 is not ready, else the tray moves without stop to operator 2.

[0020] Operator 2 puts at the different working tables more items including the first food items on the tray and releases the tray again to go through buffer 2 and on the operator 3.

[0021] Operator 3 puts the last items including food on the tray and checks it (quality control). He then takes the tray off the conveyor and puts it in the airline trolley which is transferred to a trolley lifter.

[0022] In the carrier lifters behind each working table and the buffer, where food is stored for some time, the system is cooled, so that food component temperatures are kept at safe level (cool chain). At each workstation a counter indicates how many trays have to still be made (separate counter for each place), depending from a specific order.

[0023] On each workstation a foldout chair allows the operator to change working position from standing to sitting (operation by hand or footswitch).

[0024] Figure 2 shows schematically a top view of a tray setting system with three workplaces 10, 11 and 12 each equipped with two or three working tables 13 - 20 for each operator. Behind (or in front) of each working

table 13 - 20 a carrier lifter 21 can be placed from which the operator takes the items to be placed on trays.

[0025] Between adjoining workplaces buffer tables 22, 23 are arranged, comprising e.g. nondriven roller tables permitting, if necessary the storing of a number of trays. 5

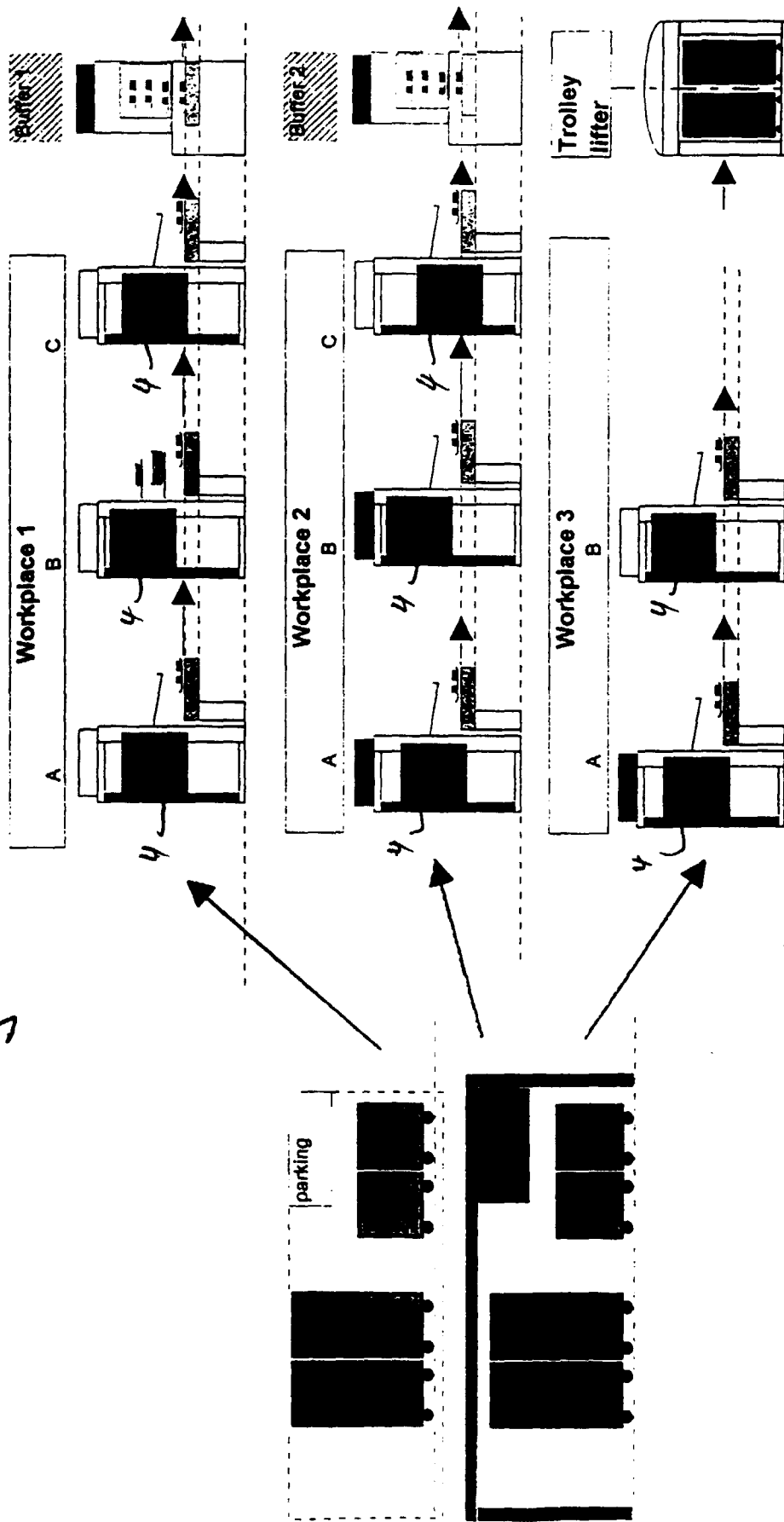
[0026] The shown arrangement of the working tables of each workplace on partial circle allows an operator to easily reach all three tables. Furthermore, the whole system requires a minimum of space if arranged in this manner. 10

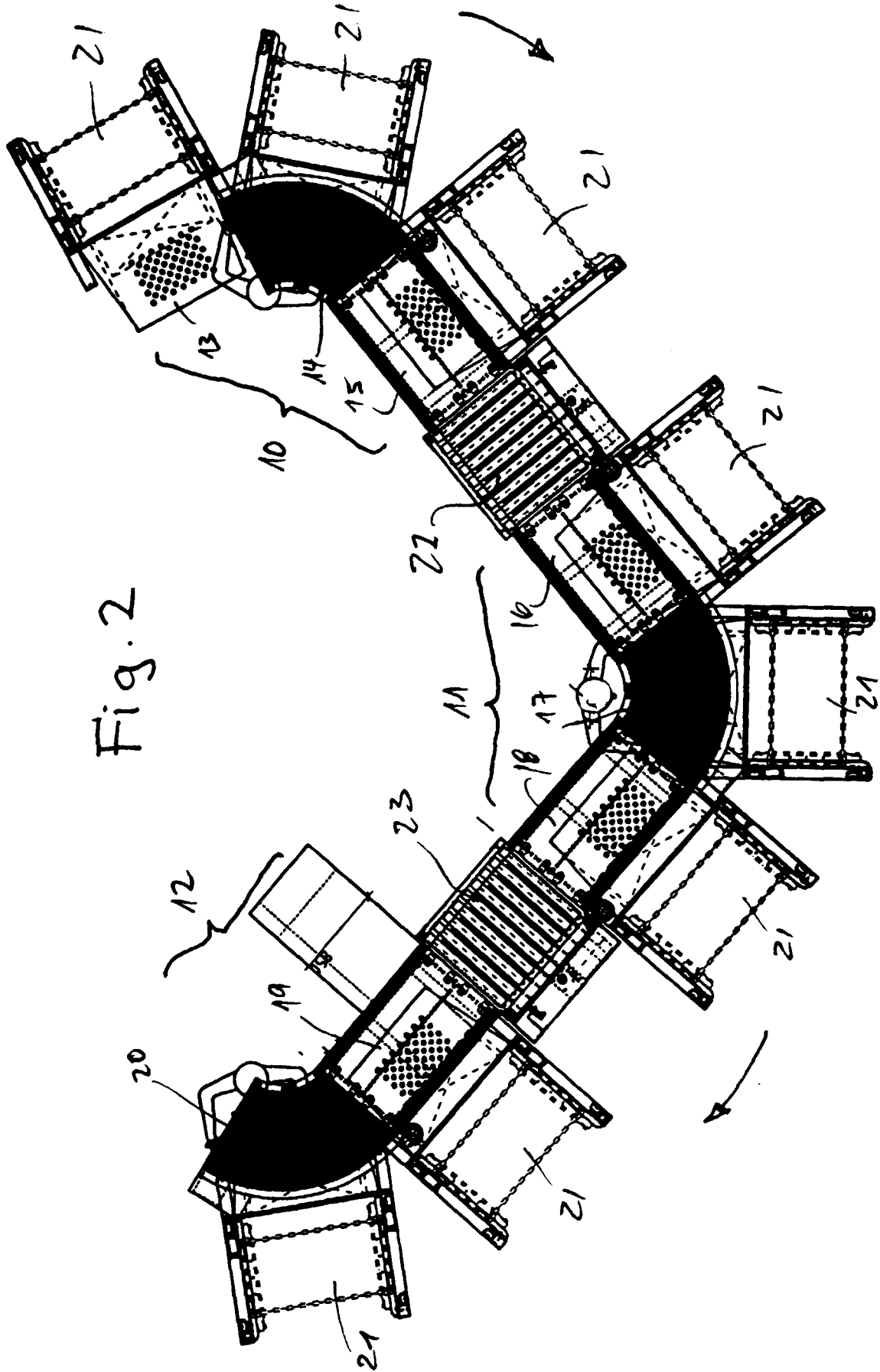
Claims

1. A method of setting trays to be packed with items, such as food, particularly for airline catering, comprising in combination: 15
 - feeding items in bins or open stored in carriers from a predetermined parking area to the feeding side of a tray setting system comprising a plurality of workplaces; 20
 - placing the carriers in carrier lifters bringing the carriers to any desired height at each workplace for being destacked; 25
 - sliding out from holding shelves at the front ends of the carrier lifters the desired items in the carriers to bring them in a position ready for the operator for placing them on trays also stored at the workplaces; 30
 - first placing manually the tray and optionally a traymat on the conveyor; 35
 - placing additional items like glass and cutlery on the trays;
 - passing the such filled trays directly or through a buffer from the first workplace to at least a second workplace where more items, including food items are placed on the trays by a second operator; 40
 - passing such trays directly or through a buffer from the second workplace to at least one further workplace for placing last items and for quality control by a further operator, and finally; 45
 - taking each such prepared tray off the conveyor and putting the trays in a trolley for being transferred to a storing place. 50
2. A tray setting system for trays to be packed with items and food, particularly for airline catering, particularly for carrying out the method of claim 1, comprising a plurality of workplaces for manually setting 55

trays; the different workplaces being interconnected by conveyors; each workplace being equipped with carrier lifters for carriers displaceable from a parking area to the feeding side of each workplace, said carriers containing items to be placed on trays at said workplaces; each of said carrier lifters being arranged to bring the carriers to the correct height in front of the workplace for easy handling by an operator.
3. A system as claimed in claim 2, wherein each workplace has a plurality of worktables each of which having a carrier lifter directly in front of the table for feeding different items to be placed on the trays by one and the same operator occupying said workplace.
4. A system as claimed in claim 3, wherein each workplace is equipped with three worktables, preferably arranged on a partial circle for being easily reached by an operator at said workplace.
5. A system as claimed in claims 3 or 4, wherein said worktables form part of the conveyor system.
6. A system as claimed in any of claims 2 to 5, wherein buffer zones, preferably in form of not driven roller tables, are provided between the workplaces in the conveyor system.

Fig. 1







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 12 2095

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 1 397 207 A (KUEPPERSBUSCH) 11 June 1975	2	A47F10/06
A	* page 1, line 84 - page 3, line 11; figures *	1	
A	US 3 578 148 A (PINCKARD CHARLES P) 11 May 1971 * column 2, line 7 - column 3, line 36; figures *	1,2	
A	WO 97 38614 A (GRANDI RENE) 23 October 1997 * page 3, paragraph 2 - page 6, last paragraph; figures *	1,2	
A	GB 2 084 120 A (AMF INC) 7 April 1982 * the whole document *	1,2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47F A47G E04H B65G B23Q B64D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 June 1999	Examiner Vistisen, L
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 12 2095

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-06-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1397207 A	11-06-1975	DE 2238713 A	21-02-1974
		AT 325517 B	27-10-1975
		BE 802825 A	16-11-1973
		CH 554282 A	30-09-1974
		FR 2194633 A	01-03-1974

US 3578148 A	11-05-1971	NONE	

WO 9738614 A	23-10-1997	NONE	

GB 2084120 A	07-04-1982	US 4345802 A	24-08-1982
		AU 7482681 A	25-03-1982
		CA 1155091 A	11-10-1983
		DE 3135403 A	19-05-1982
		JP 57085781 A	28-05-1982
