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(54) METHOD AND DEVICE FOR PLACING PRODUCTS, SUCH AS FRAGILE FOOD PRODUCTS, IN CAVITIES

VERFAHREN UND VORRICHTUNG ZUM EINBRINGEN VON GEGENSTÄNDEN , WIE
EMPFINDLICHEN NAHRUNGSMITTELN, IN TASCHEN

PROCEDE ET DISPOSITIF POUR PLACER DES PRODUITS TELS QUE DES PRODUITS
ALIMENTAIRES DELICATS, DANS DES CAVITES

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DE-A- 2 119 962 **US-A- 4 525 985**

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Description

During automatic placing, in holders of pre-formed plastic, of food products such as chocolate tea cakes and specifically chocolate munch mallows, large problems occur due to the fragility thereof. In practice such fragile products are mostly placed into the pre-formed holders by hand. The pre-formed holders with the food products are then normally sealed off with plastic foil or a lid, so that these can be transported fresh to the shops.

An apparatus for automatically packaging articles corresponding to the precharacterizing part of claim 4 is known from the US-A-4 525 985.

A further apparatus for automatically packaging pasta is known from the DE-A-2119962.

The present invention provides according to claim 1 a method for placing products, such as fragile food products, in to one or more holders, comprising the following steps:

- moving one or more placing elements downwards to engage products supported by support means;
- bringing the products above the one or more holders by means of the placing elements, so that the products drop into the holder under their own weight;
- moving the placing elements upwards and back to the position whereunder the products are brought to, wherein the placing elements comprise element parts moveable to and from each other.

Using the method according to the present invention, products, especially fragile food products, can be aligned, positioned and placed in holders substantially without damaging the products.

Further advantages, characteristics and details of the present invention will become clear from the following description of a preferred embodiment thereof, wherein reference is made to the accompanying drawings which show:

figure 1 a perspective view of a first embodiment of the apparatus and method according to the present invention;

figure 2 a perspective view of a second preferred embodiment of the method and apparatus according to the present invention;

figure 3 a perspective view of a third preferred embodiment of the method and apparatus according to the present invention.

An apparatus 1 (fig. 1) is set up near to the end of a conveyor T whereupon fragile food products are found, in the present example of the embodiment filled cakes C, which are transported directly from an oven not shown at a constant speed. The apparatus 1 comprises a frame 2 for guiding placing and catching elements 3, 4 respectively which are moveable to and from, according to

the double arrow A, within the frame 2. With help of a rod 5, and schematically shown driving means 6, the placing elements 3, 4 are also moveable in an upward and downward direction according to the double arrow B.

With help of the placing elements 3, 4, which in the present embodiment take the form of comb-like elements, two rows of filled cakes C are pushed over a table part 7 into holders 10, which are placed at a short distance under an edge 8 of the table part 7. The two rows of filled cakes C are, in this manner, dropped above each other into the holders 10. The holders 10 are, with the help of the conveyors 11, 12 and 13 respectively, brought to and taken away from the table part 7, as well as preferably being automatically placed with the help of schematically shown pushing means (double arrow D) 14, so that four filled cakes are placed in each holder 10 in the present embodiment.

After the placing elements 3, 4, which are driven by schematically shown driving means 9, are placed above the holders 10, these placing elements 3, 4 are moved upwards and subsequently back to above the conveyor T which in the meantime advances with a constant relatively low speed, so that two rows of filled cakes C can again be placed in the relevant holders 10.

In a second preferred embodiment of the apparatus 19 (fig. 2) according to the present invention, particularly suitable for packing chocolate tea cakes also known as chocolate munch mallows N which are moved in the direction of the arrow E on the conveyor T', the chocolate munch mallows or other fragile products require to be accurately placed with respect to the pre-formed holders 30, because each chocolate munch mallow N has to drop, under its own weight, in the correct opening without these being pushed against each other. In the shown embodiment four rows of six chocolate munch mallows are accurately positioned, due to the fact that placing elements 22, 23, 24 and 25 are displaceable with regard to the position, shown by the broken lines, to the position shown by the unbroken lines.

An upper frame part 20 is preferably vertically displaceable in lower frame parts 21, as shown by arrow G, so that the placing elements 22, 23, 24 and 25 may be displaced without damaging the chocolate munch mallows.

In a manner not shown, the placing elements 22-25 preferably have comb-like parts which grip around the chocolate munch mallows. The twenty-four chocolate munch mallows are brought above a table part 26, in accurate mutual positions, whereafter the table part 26 is moved from underneath them (arrow F) whereby the chocolate munch mallows drop, under their own weight, into the pre-formed holders 30.

In the same way as described in figure 1, the placing elements 22 to 25, are moved upwards as well as back, to the starting position to above the end of the conveyor T', after a holder 30 has been filled with chocolate munch mallows, so that twenty-four chocolate munch mallows can once more be placed in a holder

30.

A third embodiment of the apparatus 31 (figure 3) according to the present invention, is also particularly suitable for packing chocolate munch mallows or other such fragile food products.

This apparatus 31 is set up near the end of a conveyor T" whereupon the chocolate munch mallows N are transported. The apparatus 31 preferably comprises a frame 32 for a placing member 33, which preferably comprises four suspending elements 34, from which a number of catching elements, preferably in the form of fingers 35, are suspended. The suspending elements 34 are preferably linked together by two harmonica-like linking elements 36. The frame 32 preferably is rotated by a bar 37, to tilt upwards and downwards, which is driven by an, in preference, electric motor 39. Two preferably passive pistons 38 are employed in order to offer increased stability to the frame 32, when the latter is tilted up and down.

As a batch of munch mallows N approach the apparatus 31, the frame 32 is in a raised state, and the linking elements 36 are in an extended, open position, as shown by the broken lines. Once the munch mallows N are beneath the placing member 33, the frame 32 is tilted downwards so that the fingers 35 are situated between the rows of munch mallows N. The linking elements 36 are then closed, causing the fingers 35 to align the munch mallows N in a ready to be packed state. Two runners 40 are preferably employed to open and close the harmonica-like linking elements 36. These runners 40 are connected to the linking elements 36 preferably by screws (not shown) and are powered to run along the frame 32 by an, in preference, electric motor (also not shown).

On lowering the placing member 33 with the linking elements 36 open, the fingers 35 come between the rows of munch mallows N. Therefore it is not necessary for these to be exactly positioned on the conveyor T" as closing the linking elements 36 causes the fingers 35 to move towards each other, an action which catches stray, irregularly positioned munch mallows N to align these together with the other munch mallows N.

The co-operation between the linking elements 36 and fingers 35, via the suspending elements 34, gathers the munch mallows N together without the danger of these being squashed during downward movement of the placing member 33 and ensures that the munch mallows N do not damage each other by coming into contact.

The placing member 33 is then moved along the frame 32, preferably via a hydraulic piston 41, which is preferably stabilised by a bar, so that the placing member 33 comes to stop above a table part 42. The table part 42 is preferably moveable along the frame 32, via a slider 43 which is preferably powered by an electric motor 44, the movement of the slider 43 and the table part 42 being shown by the double headed arrow K. In figure 3, the table part 42 is situated above a conveyor 45, preferably powered by an electric motor 46, on

which holders 47, for the munch mallows N are supplied.

Directing elements, which in the present embodiment preferably take the form of two walls 48 and 49 respectively, direct the holders 47 to a precise position beneath the table part 42. These holders 47 are preferably held here by preferably retractable stops 50, whilst the holders 47 are filled with the munch mallows N.

The table part 42 is then preferably rapidly moved from beneath the munch mallows N in the direction of the bar 37, so that the munch mallows N fall into the holders 47. The stops 50 are then retracted to allow removal of a filled holder and positioning of the next empty holder.

The frame part 32 is subsequently raised, the placing member 33 brought into position and the table part 42 returned to above the conveyor 45 so that the next batch of chocolate munch mallows can be packed.

Due to the elegant, yet simple, construction of this embodiment of the present invention, it is relatively quick and easy to disassemble and reassemble the apparatus to pack different products.

In a variation not shown, this embodiment can stack products on top of each other by a double movement of the table part 42, the first movement dropping a food product into a holder whilst simultaneously causing a second product to move to the edge of the table part 42, the second movement of the table part 42 causing the second food product to drop into the holder on top of the first product.

In a manner not shown it is also possible that, as in figure 1, the table parts 26 and 42 of respectively figures 2 and 3 are fixedly arranged, whilst the chocolate munch mallows and the holders are moved in mutual synchronisation to the edge of the table part.

Preferably holders are used with the apparatus according to figures 1, 2 and 3, which are fixed together in a suitable number. For instance in figure 1 five packings for every four filled cakes, the packings being easily separated from each other by a few hand movements and, with the embodiment according to figure 2, two packings for every twelve chocolate munch mallows in three rows of four.

It will be apparent that with the help of the above described method and apparatus, the necessary amount of hand work in the packing of fragile food products is a great deal reduced. The above described apparatus can, in a simple manner, be fitted into an existing transport system wherein food products are transported at a constant speed out of an oven.

The present invention is in no way limited to the above described preferred embodiments; the requested rights rather being specified by the following claims.

Claims

1. Method for placing products (C; N), such as fragile food products into one or more holders (10; 30; 47) comprising the following steps:

- moving one or more placing elements (3, 4; 22, 23, 24, 25; 34,35) downwards to engage products (C; N) supported by support means (T), for example a conveyor;
 - bringing the products (C; N) above the one or more holders (10; 30; 47) by means of the placing elements (3, 4; 22, 23, 24, 25; 34, 35), so that the products (C; N) drop into the holders (10; 30; 47) under their own weight, and;
 - moving the placing elements (3, 4; 22, 23, 24, 25; 34, 35) upwards and back to the position whereunder the products (C; N) are brought to, characterized in that the placing elements (3, 4; 22, 23, 24, 25; 34, 35) comprise element parts moveable to and from each other.
2. Method according to claim 1, wherein the placing elements (22, 23, 24, 25) are moved in the same direction as a transport element (26) whereon the products (N) are transported and wherein the products (N) are pushed along the support means (T) to above each holder (30) by the placing elements (22, 23, 24, 25).
3. Method according to claim 1 wherein the products (C) are filled cakes and the placing elements (3, 4) comprise two comb-like plate elements which grip onto a row of filled cakes (C) and bring these above each other in a number of holders (10) arranged at an end (8) of a transport element (7).
4. Apparatus for placing products (C, N), such as fragile food products, into holders, comprising:
- a frame (2; 20, 21);
 - placing elements (3, 4; 22, 23, 24, 25; 34, 35) which are movable upwards and downwards, in relation to the frame (2; 20, 21);
 - means for moving the placing elements (3, 4; 22, 23, 24, 25; 34, 35) along the frame; and
 - support means (7; 26; 42) for supporting the products, characterized in that the placing elements (3, 4; 22, 23, 24, 25; 34, 35) comprise element parts movable to and from each other.
5. Apparatus according to claim 4 wherein the placing elements (3, 4) comprise at least two comb-like plate elements with which the products can be pushed.
6. Apparatus according to claim 4, wherein the placing elements comprise a number of catching elements in the form of fingers (35), which fingers (35) are individually engageable with the products (N) in order to catch and impart movement thereto.
7. Apparatus according to any of the claims 4 - 6, provided with moving means (11, 12, 13; 45) for moving one or more of the empty holders (10; 30; 47)

into position in order to receive products (C, N), and/or holders (10; 30; 47), filled with products (C, N), away from the apparatus.

Patentansprüche

1. Verfahren zum Einbringen von Produkten (C; N), wie beispielsweise empfindliche Nahrungsmittel, in einen oder mehrere Halter (10; 30; 47), das die folgenden Schritte aufweist:
 - Abwärtsbewegen eines oder mehrerer Einbringelemente (3, 4; 22, 23, 24, 25; 34, 35) derart, daß sie in Eingriff gelangen mit Produkten (C; N), die von Tragemitteln (T) - beispielsweise einem Förderer - getragen werden;
 - Verbringen der Produkte (C; N) oberhalb des einen oder der mehreren Halter (10; 30; 47) mit Hilfe der Einbringelemente (3, 4; 22, 23, 24, 25; 34, 35), so daß die Produkte (C; N) aufgrund ihres Eigengewichtes in die Halter (10; 30; 47) fallen; und
 - Bewegen der Einbringelemente (3, 4; 22, 23, 24, 25; 34, 35) nach oben und zurück zu der Position, unter welche die Produkte (C; N) gebracht wurden, dadurch gekennzeichnet, daß die Einbringelemente (3, 4; 22, 23, 24, 25; 34, 35) Elementeteile aufweisen, die aufeinander zu- und voneinander wegbewegbar sind.
2. Verfahren nach Anspruch 1, wobei die Einbringelemente (22, 23, 24, 25) in die gleiche Richtung bewegt werden wie ein Transportelement (26), auf dem die Produkte (N) transportiert werden und wobei die Produkte (N) entlang der Tragemittel (T) durch die Einbringelemente (22, 23, 24, 25) über jeden Halter (30) geschoben werden.
3. Verfahren nach Anspruch 1, wobei die Produkte (C) gefüllte Kuchen sind und die Einbringelemente (3, 4) zwei kammartige Plattenelemente umfassen, die auf eine Reihe gefüllter Kuchen (C) greifen und diese übereinander in mehrere Halter (10) bringen, die an einem Ende (8) eines Transportelementes (7) angeordnet sind.
4. Vorrichtung zum Einbringen von Produkten (C; N), wie beispielsweise empfindliche Nahrungsmittel in Halter mit:
 - einem Rahmen (2; 20, 21);
 - Einbringelementen (3, 4; 22, 23, 24, 25; 34, 35), die relativ zu dem Rahmen (2; 20, 21) nach oben und unten bewegbar sind;
 - Mitteln zum Bewegen der Einbringelemente (3, 4; 22, 23, 24, 25; 34, 35) entlang des Rahmens; und
 - Tragemitteln (7; 26; 42) zum Tragen der Produkte, dadurch gekennzeichnet, daß die Ein-

bringelemente (3, 4; 22, 23, 24, 25; 34, 35) Elemententeile aufweisen, die aufeinander zu- und voneinander weg bewegbar sind.

5. Vorrichtung nach Anspruch 4, wobei die Einbringe-
elemente (3, 4) wenigstens zwei kammartige Plat-
tenelemente aufweisen, mit denen die Produkte
geschoben werden können. 5
6. Vorrichtung nach Anspruch 4, wobei die Einbringe-
elemente mehrere Greifelemente in Form von Fin-
gern (35) aufweisen, wobei die Finger (35)
individuell mit den Produkten (N) in Eingriff gelan-
gen können, um diese zu greifen und ihnen Bewe-
gung aufzuerlegen. 10 15
7. Vorrichtung nach einem der Ansprüche 4 bis 6, mit
Bewegungsmitteln zur Bewegung eines oder mehr-
erer der leeren Halter (10; 30; 47) in eine Position,
in der sie Produkte (C; N) empfangen können 20
und/oder zum Bewegen von mit Produkten (C; N)
gefüllten Haltern (10; 30; 47) von der Vorrichtung
weg.

Revendications

1. Procédé pour placer des produits (C ; N), tels que
des produits alimentaires fragiles, dans un ou plu-
sieurs récipients , comprenant les étapes consis-
tant à : 25

- déplacer un ou plusieurs éléments de place-
ment (3, 4 ; 22, 23, 24, 25 ; 34, 35) vers le bas
pour mettre en prise des produits (C ; N) portés
par des moyens supports (T), par exemple un
convoyeur ;
- amener les produits (C ; N) au-dessus d'un ou
plusieurs récipients (10 ; 30 ; 47) au moyen des
éléments de placement (3, 4 ; 22, 23, 24, 25 ;
34, 35), de sorte que les produits (C ; N) tom-
bent dans les récipients (10 ; 30 ; 47) sous
l'effet de leur propre poids, et ;
- déplacer les éléments de placement (3, 4 ; 22,
23, 24, 25 ; 34, 35) vers le haut et vers l'arrière
à la position dans laquelle les produits (C ; N)
sont amenés, caractérisé en ce que les élé-
ments de placement (3, 4 ; 22, 23, 24, 25 ; 34,
35) comprennent des parties d'éléments mobi-
les l'une vers l'autre et l'une à partir de l'autre. 45

2. Procédé selon la revendication 1, dans lequel les
éléments de placements (22, 23, 24, 25) sont
déplacés dans la même direction qu'un élément de
transport (26) sur lequel les produits (N) sont trans-
portés, et dans lequel les produits (N) sont poussés
le long des moyens supports (T), jusque au-dessus
de chaque récipient (30), par les éléments de pla-
cement (22, 23, 24, 25). 50 55

3. Procédé selon la revendication 1, dans lequel les
produits (C) sont des biscuits fourrés et les élé-
ments de placement (3, 4) comprennent deux élé-
ments formant plateau de type râteau, qui
saisissent une rangée de biscuits fourrés (C) et les
placent les uns au-dessus des autres dans plu-
sieurs récipients (10), agencés à une extrémité (8),
d'un élément de transport (7).

4. Dispositif pour placer des produits (C ; N), tels que
des produits alimentaires fragiles, dans des réci-
pients, comprenant : 10

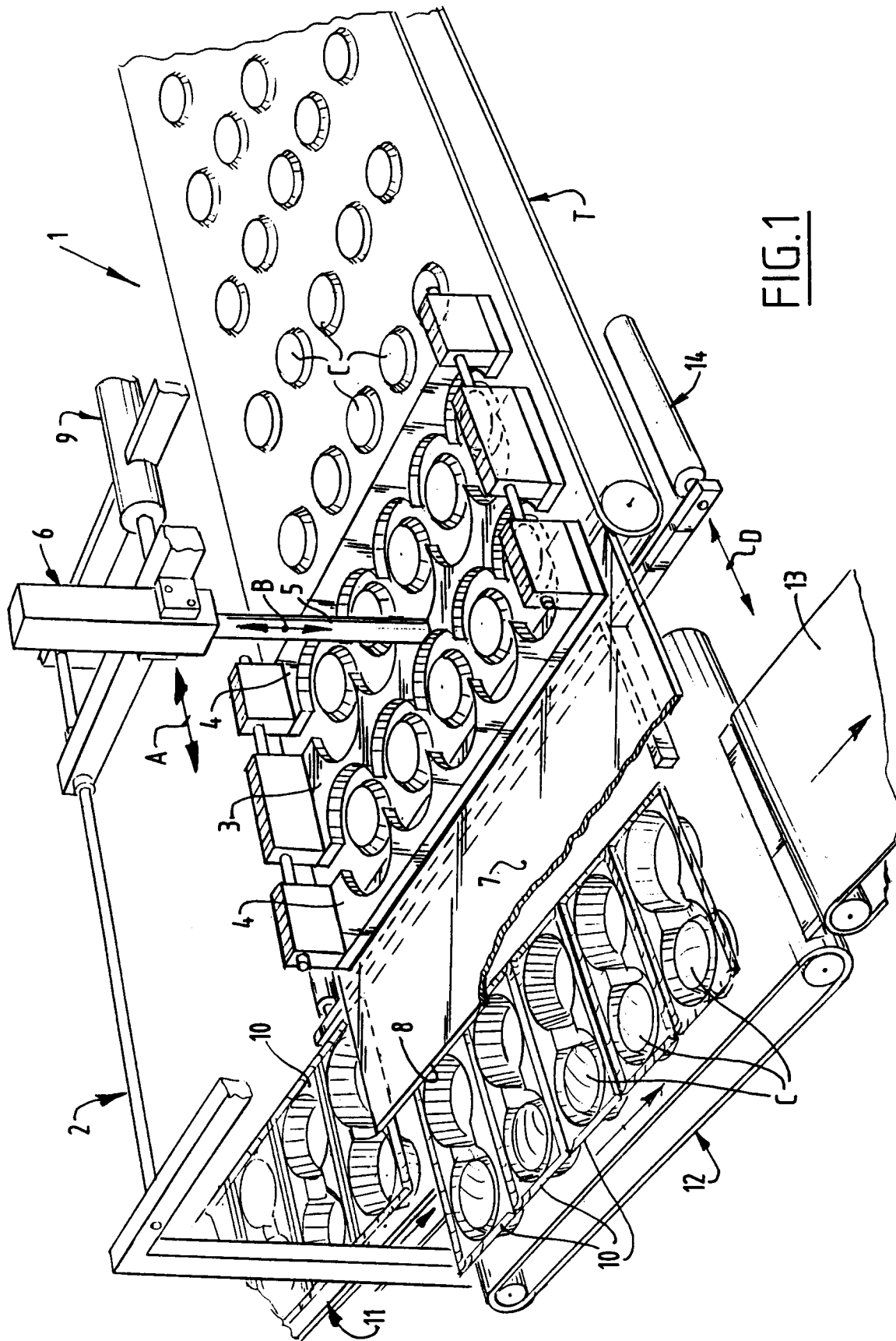
- un châssis (2; 20, 21) ;
- des éléments de placement (3, 4 ; 22, 23, 24,
25 ; 34, 35) qui sont mobiles vers le haut et vers
le bas, en relation avec le châssis (2 ; 20, 21) ;
- des moyens pour déplacer les éléments de pla-
cement (3, 4 ; 22, 23, 24, 25 ; 34, 35) le long du
châssis ; et
- des moyens supports (7 ; 26 ; 42) pour porter
les produits ;

caractérisé en ce que les éléments de place-
ment (3, 4 ; 22, 23, 24, 25 ; 34, 35) comprennent
des parties d'éléments mobiles l'une vers l'autre et
l'une à partir de l'autre. 25

5. Dispositif selon la revendication 4, dans lequel les
éléments de placement (3, 4) comprennent au
moins deux éléments formant plaque de type
râteau avec lesquels les produits peuvent être
poussés. 30

6. Dispositif selon la revendication 4, dans lequel les
éléments de placement comprennent plusieurs élé-
ments de prise en forme de doigts (35), lesquels
doigts (35) peuvent se mettre en prise individuelle-
ment avec les produits (N) afin de les saisir et leur
imposer un mouvement. 35 40

7. Dispositif selon l'une quelconque des revendica-
tions 4 à 6, muni de moyens de déplacement (11,
12, 13 ; 45), pour amener un ou plusieurs des réci-
pients vides (10 ; 30 ; 47) en position afin de rece-
voir des produits (C ; N), et/ou des récipients (10 ;
30; 47) remplis de produits (C ; N), à distance du
dispositif. 45 50



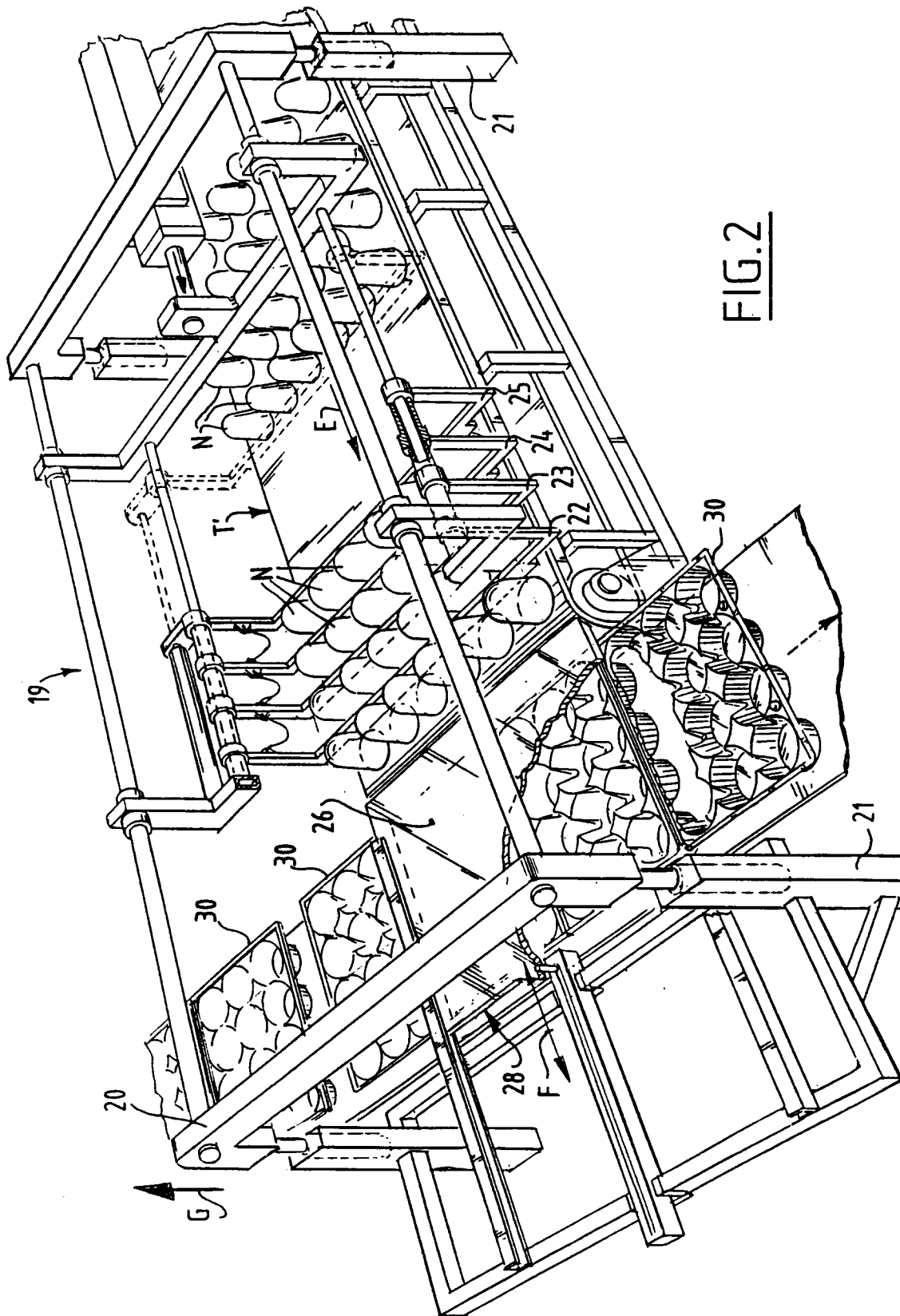


FIG. 2

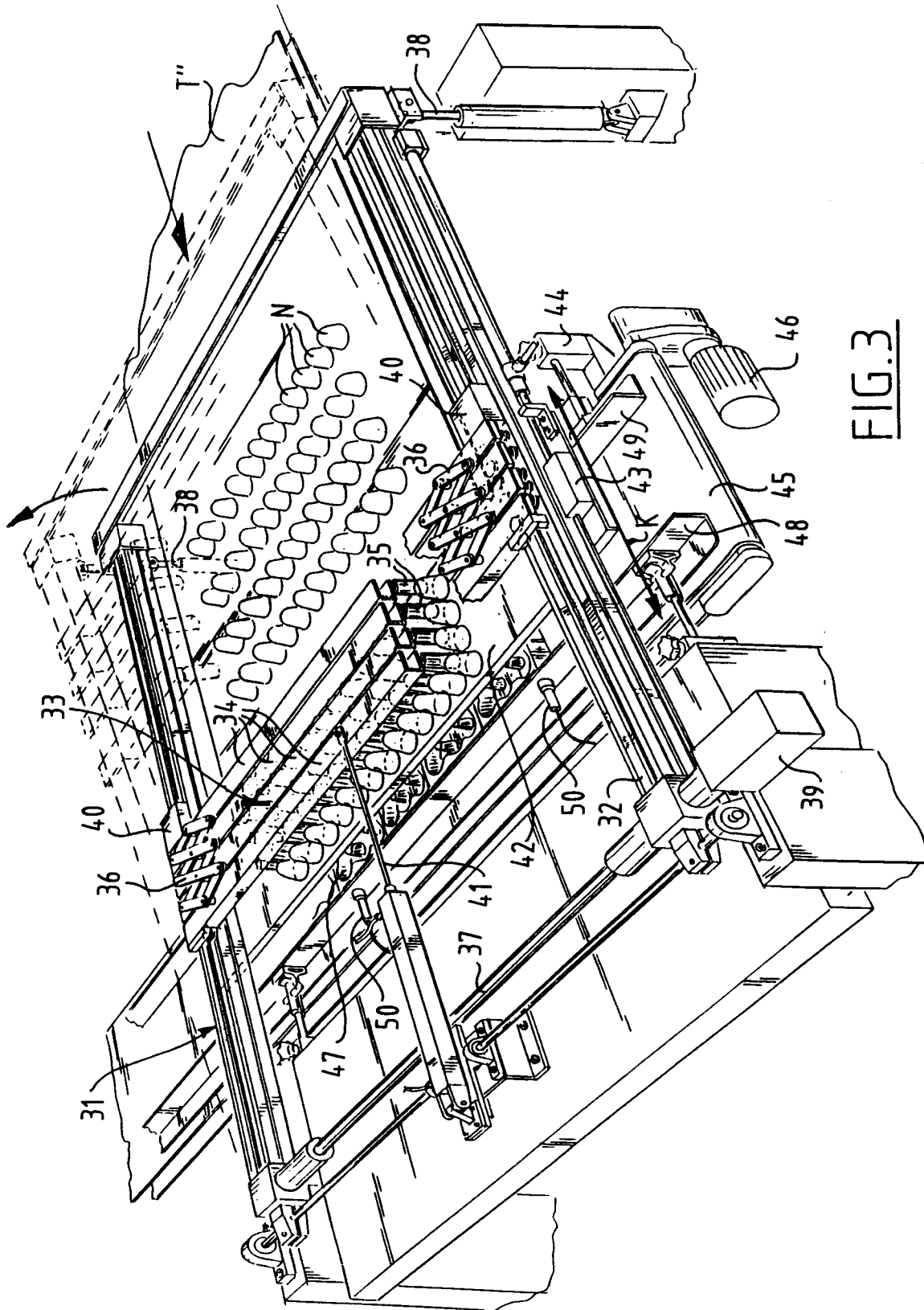


FIG. 3