

[54] **DEVICE FOR THE AUTOMATIC FILLING OF BISCUITS INTO PACKAGING CONTAINERS**

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[58] Field of Search. 53/26, 35, 154, 159, 164, 166, 53/237, 243, 246, 247, 250-252, 255

[56] **References Cited**

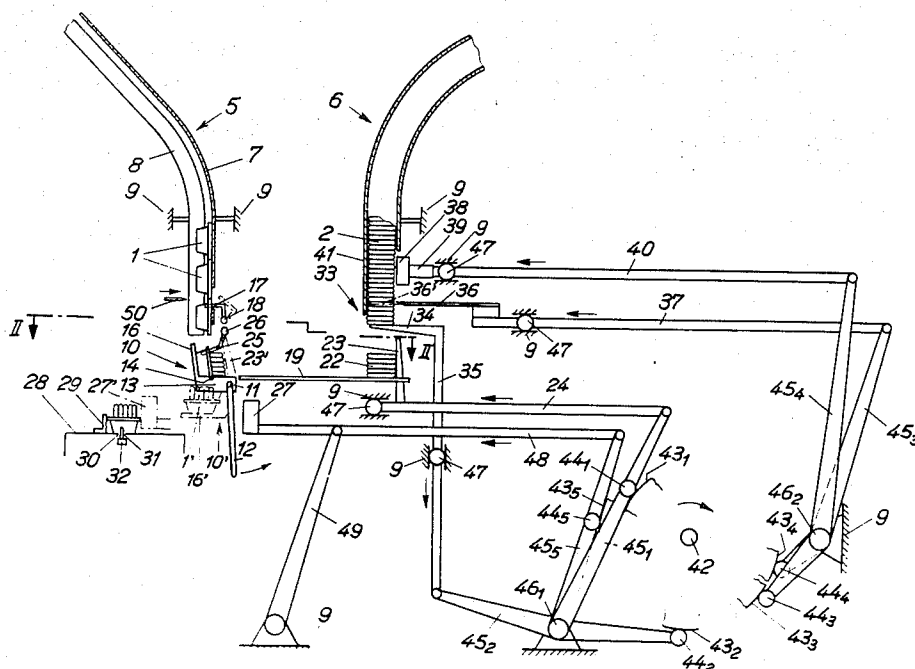
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[57] **ABSTRACT**

A device for automatic filling of biscuits into packaging containers which are open on one side is provided with a vertical channel for feeding the containers downwardly one by one onto a pivot support with the open side of the container facing sideways toward an article feed device which horizontally moves one stack of biscuits at a time into the sideways open container on said support. When the container is filled the pivot support swings the filled container about 90° so that the open side of the container faces upwardly, whereupon the filled container is conveyed away from the device along a horizontal discharge track.

7 Claims, 3 Drawing Figures



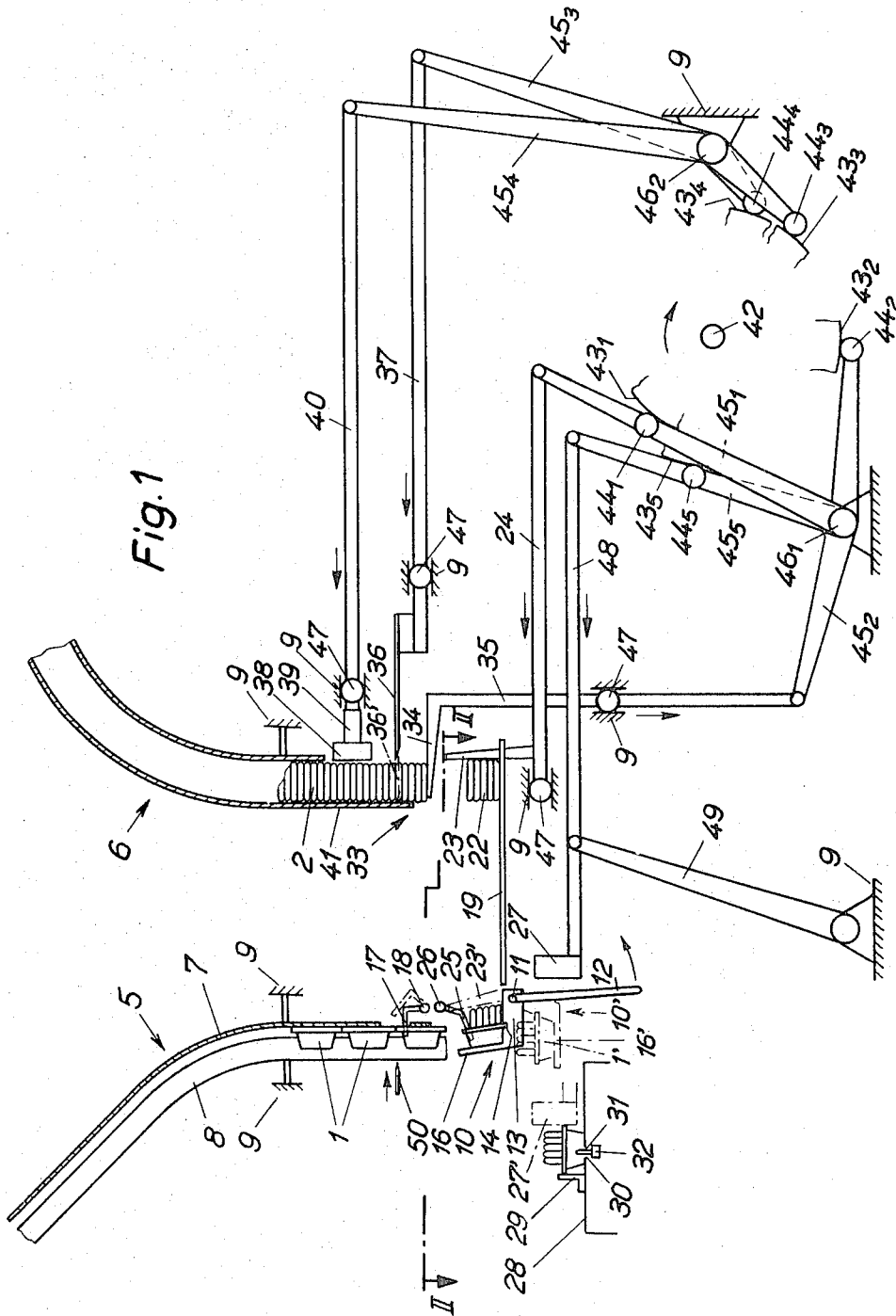


Fig. 2

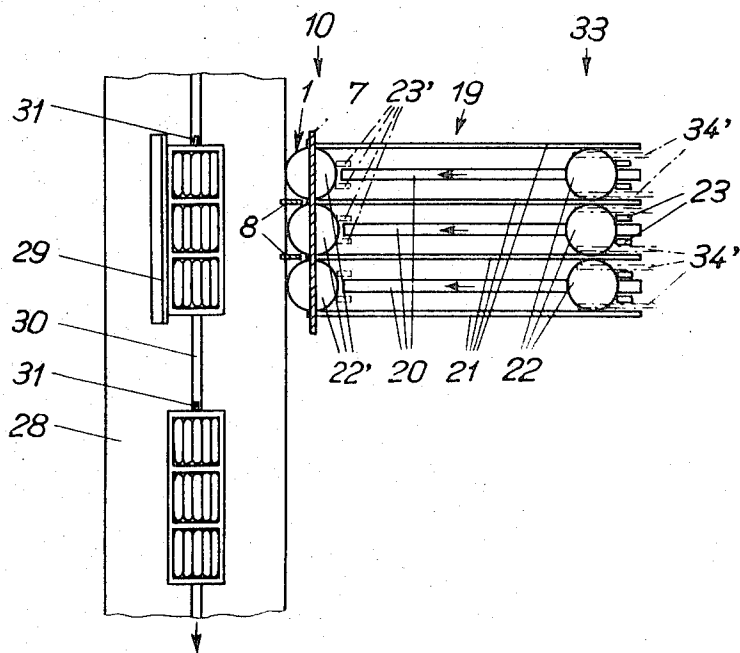
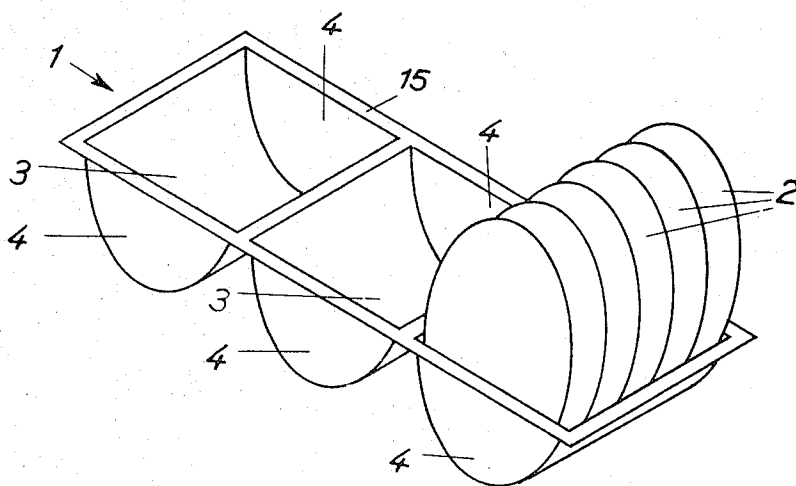


Fig. 3



DEVICE FOR THE AUTOMATIC FILLING OF BISCUITS INTO PACKAGING CONTAINERS

The invention relates to a device for the automatic filling of disc-shaped articles into packaging containers open on one side and which have at least one pocket suitable for the insertion of a stack of these articles, combined with a stacking device for the formation of vertical stacks of said articles, which stacks by a horizontal movement are introduced into the sideways-positioned container, and also having a discharge track for the carrying away of the filled container when disposed in a normal position with the open side facing upwardly. Such a device has already been disclosed by the present inventor in order to replace the previously employed manual insertion of the articles, particularly biscuits. The prior device is, however, relatively complicated, in that it has two flight-attachment chains traveling adjacent one another, of which one is provided with swingable transporting members for the container. The associated stacking device used in this connection is constructed so that it effects a mixing of the biscuits supplied by numerous channels. While this is in certain cases an advantage, in many cases, however, it is unnecessarily complicated. A further disadvantage of this prior device resides in the difficulty of adjusting the same to containers or articles, respectively, of other dimensions.

In order to overcome these disadvantages, the device according to the invention is distinguished in this, that a downwardly directed inlet channel is provided for the feed of the empty containers, and in which the containers are so guided that they are disposed in the lowermost, at least approximately vertical end of this channel in a sideways tilted position, that below the end of the channel a pivot support is provided which in each case receives the lowermost container in a sideways tilted position, that the stacks formed in each case by the associated stacking device are discharged by the latter one by one at one end of a slide track; that flights are provided which move the stack or stacks along the slide track and into the pocket or the pockets of the container disposed with its open side facing the oncoming stack on the pivot support; that the pivot support hereupon pivots the filled container at least approximately into normal position with its open side facing upwardly, whereupon the filled container is brought transferred to a discharge track.

In the drawings, an embodiment by way of example of the object of the invention is shown diagrammatically.

FIG. 1 shows a side view of a filling device.

FIG. 2 shows a horizontal section along the line II—II of FIG. 1, and

FIG. 3 shows a perspective view of a partly filled packing container.

The filling device shown has the purpose to fill containers 1 which are open at one side, with biscuits 2. As best illustrated in FIG. 3, each container 1 which consists for example, of thin, deeply drawn transparent plastic sheet, has three semi-cylindrical pockets 3 lying adjacent one another, of which in FIG. 3 one is filled with biscuits 2, while the two other pockets are empty. The pockets 3 are at their ends closed by walls slightly diverging upwardly and the center pocket on its longitudinal sides is connected with the two other pockets. The position shown in FIG. 3, in which the upper side of the container 1 is open, and rests on the bottoms of

the pockets 3, respectively, is designated as "normal position."

Referring now principally to FIGS. 1 and 2, the filling device has a substantially vertical inlet channel 5 for the container 1 and three substantially vertical inlet channels 6 for the biscuits 2. The three channels 6 are arranged according to FIG. 2 one next to the other and parallel to one another. The channels 5 and 6 are directed downwardly and are vertical in their lowermost portions. The channel 5 has for the guidance of the open side of the container 1, a wall 7, opposite to which are positioned two laterally spaced rails 8. The wall 7 engages the open side of the container, while said rails 8 according to FIG. 2 project between two adjacent pockets 3 of the container 1. The guide wall 7 and the guide rails are fixed on the machine frame of which only a few parts are indicated in FIG. 1 and are provided with the reference character 9. The biscuit inlet channels 6 may be constructed as closed tubings or may be composed of a plurality of parallel guide-bars. It is obvious that in place of the wall 7 of the channel 5, also a few parallel bars could be employed. It is to be pointed out that in the containers 1 disposed in the lower part of the channel 5, the semi-circular end walls 4 of the pockets 3 are disposed horizontally. This position of the container 1 is designated as "side position."

Below the lower end of the channel 5 is arranged a pivot support 10 which is fixed to an axis of rotation 11 positioned stationary in the framework. This axis 11 may be pivoted by a lever 12 in counterclockwise direction, in order to move the pivot support 10 from its position shown in full lines close to a substantially 90° tilted position 10' shown in dash-dotted lines. The pivot support 10 has a supporting surface 13 with a groove 14 for a projecting edge 15 on the container, as well as an abutment surface 16 approximately perpendicular thereto. A retainer flap 17 which is pivotally mounted on an axis 18 above the container 10 to the framework, holds in its solid line position the lowermost container 1 in the channel 5, until it is swung into its position indicated in dash-dotted lines. Then the container 1 drops on the supporting surface 13 and the flap 17 is immediately swung back again in order to retain the next container 1 coming down the channel 5.

In order to fill the biscuits 2 into the container 1 lying on its side on the supporting surface 13, a slide track 19 is provided which, according to FIG. 2 in the present case consists of three horizontal supporting tracks 20 each provided with two guide walls 21 for each stack 22 of biscuits. In order to slidably move the stack 22, there are provided for each of the same two flight fingers 23 on both sides of the supporting track 20. All six fingers 23 are fixed on a connecting-rod 24, by means of which they may be brought into the position 23' shown in dash-dotted lines. The three stacks 22 are thereby slidably introduced into the pockets 3 of the container 1, which is pressed against the abutment surface 16. When this happens the uppermost biscuit of the stack 22' when moving to the left actuates a small flap 25, which is loosely mounted on a horizontal shaft 26, so that it presses the respective end wall 4 somewhat upwardly, in order then to facilitate the introduction of the stack 22'. Each of the three flaps 25 acts accordingly somewhat like a shoehorn upon putting on a shoe.

After the pivot support 10 has been swung into the horizontal position 10', so that the filled container 1

lies now in a normal position on the abutment surface 16', it is pushed by means of a discharge plunger 27 onto a horizontal discharge track 28. The plunger 27 thereby comes into the position indicated in dash-dotted lines at 27' and a stop member 29 takes care of the centering on the track 28. The track 28 has a central slot 30, through which flights 31 of a conveyor chain 32 project upwardly, in order to convey the filled containers outwardly. It is to be noted that the pivot support 10 and the plunger 27 are constructed as a grate in a manner not shown in greater detail, and comprise each several parallel parts, whereby the parts of the plunger are slidable between the parts of the pivot support, somewhat like the fingers 23 between the supporting tracks 20. It is obvious that the discharge track 28 may also be constructed otherwise, for example, as an endless belt.

In order to form three stacks 22, there is provided on the lower end of the channels 6 a stacking device 33 which comprises a bracket 34 which is arranged on the upper end of an approximately vertical connecting rod 35. The bracket 34 consists of individual parallel elements 34', which are indicated in dash-dotted lines in FIG. 2, and which upon downward movement of the vertical connecting-rod 35 have room between the supporting tracks 20 and the fingers 23. The three columns of biscuits contained in the channels 6 are supported on the bracket 34. In order to separate from each column of biscuits in the channels 6 a predetermined number of biscuits which are to form the stack 22, a horizontal separating slide member 36 is provided above the bracket 34. This slide member 36 is fixed to one end of an approximately horizontal connecting rod 37, and upon movement of the slide member 36 to the left into the operating position 36' indicated in dash-dotted lines comes between two biscuits. In order to relieve the separating slide member 36 in its operating position 36' from the weight of the biscuits above it, there is provided above the separating slide member 36 a soft, holding plunger 38, for example, made of rubber, which by a resilient element 39 is fixed to an approximately horizontal connecting rod 40. Upon movement of the connecting rod 40 to the left, the biscuits engaged laterally by the plunger 38 are pressed against the oppositely disposed channel wall 41 and thus held tight and cannot drop. The formation of stacks with the aid of separating slide members and holding plungers as described is quite conventional. It is also known to construct the front edge of the separating slide member 36 in a special manner, for example, as elastic locator roller, in order to facilitate an entry between the biscuits without damaging the same.

During the downward movement of the bracket 34, the stacks 22 are deposited one at a time on the right hand end of the slide track 19, where they are themselves engaged by the vertical fingers 23 and finally are pushed into the pockets 3 of the container 1. Meanwhile, the bracket 34 is again moved upwardly.

The described movements of the individual members of the filling device are imparted by a main shaft 42, on which are arranged control cams 43₁, 43₂, 43₃, 43₄ and 43₅, which cooperate with cam followers 44₁, 44₂, 44₃, 44₄ and 44₅, which are arranged on levers 45₁, 45₂, 45₃, 45₄, and 45₅, swingable about axes 46₁ and 46₂, respectively, and are held by means of springs, not shown, in contact with the cams. The levers 45₁ to 45₄ are connected by not referenced pivot joints, with the connect-

ing rods 24 and 35, 37 and 40, respectively, which on the one hand, are guided by means of cross-heads 47 on corresponding frame parts 9. The lever 45₅ is pivoted to a horizontal connecting rod 48, which carries on its left hand end the plunger 27, which slides the filled container 1' on the discharging track 28. For a straight guiding of the connecting rod 48, the latter is also pivoted between its ends to the upper end of a lever 49, which is pivoted with its lower end to a frame part 9.

For the synchronized movement of the retainer flap 17 and the lever 12 actuating the pivot support 10, further control cams may be provided on the main shaft 42 and corresponding control rods or some other control— and transfer— members.

Advantageously the joints and the cam followers 44 are adjustably arranged on the levers 45, so that it is easily possible without exchange of the control cams to convert the filling device to the filling of biscuits of other size in corresponding containers.

The containers 1 may have more or less than three pockets, whereby the latter need not absolutely have to have a semicircular cross section. The deeply drawn containers 1 made of a plastic sheet may still be connected with one another when they are supplied by the deep draw machine directly to the inlet channel 5. In such a case, the retainer flap 17 is superfluous, but then at the lower end of the inlet channel 5, a cutting device 50 would have to be provided, in order to separate the lowermost container 1 so that it drops onto the pivot support 10.

Upon conversion of the filling device to other biscuits and containers, obviously the inlet channels 5 and 6 are to be correspondingly adjusted or to be exchanged for other channels.

What I claim is:

1. In a device for the automatic filling of disc-shaped articles into packaging containers which are open on one side and which have at least one pocket suitable for the insertion of a stack of said articles, in combination with a stacking device for the formation of vertical stacks of said articles which by means of a horizontal movement are introduced into the pockets of said containers disposed with their open side sideways, and a discharge track for discharging the filled containers when the latter are disposed in a normal upright position in which their open side faces upwardly, wherein the improvement comprises a downwardly directed inlet channel for downwardly feeding empty containers in said inlet channel including guide means for guiding the containers in such a manner that at least in the lowermost portion of said inlet said containers will be positioned sideways with their open sides, a pivotally mounted support bracket disposed below the lower end of said inlet channel to receive the lowermost container in its lateral open position; said stacking device including a horizontal slide track, means for depositing stacks of articles on said horizontal slide track, actuators for moving said stack of articles along said slide track and into the pockets of said container on said pivotally mounted support, means for pivoting said pivotally mounted support and the filled container thereon to an at least approximately normal position in which the open side of said filled container faces upwardly, and means for discharging said filled container from said support onto said discharge track.

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2. In a device according to claim 1, including a horizontal slidable plunger for moving the filled container from said pivotally mounted support onto said discharge track.

3. In a device according to claim 1, including a pivotally mounted retainer flap adapted to be pivoted for a short time away from the path of the containers in the lower part of the inlet channel to permit the lowermost one of said containers to drop onto said pivotally mounted support while retaining the other containers thereabove in said inlet channel.

4. In a device according to claim 1, including a loosely pivotally mounted flap arranged above said pivotally mounted support and adjacent a pocket of said container thereon, said flap, upon introduction of a stack of articles in said pocket, being drawn in by the uppermost article of said stack into the pocket in order to urge the upper wall of the pocket upwardly so as to facilitate the introduction of the stack of articles into said pocket.

5. In a device according to claim 1, wherein the containers are serially connected, and including cutting

means arranged at the lower portion of said downwardly directed inlet channel for cutting off the lowermost container from the series of connected containers.

5 6. In a device according to claim 1, in which each of the containers is provided with at least two pockets, including at least two inlet channels for supplying said articles into said container to be filled, said stacking device for said articles forming at the same time at the ends of these inlet channels the same number of stacks of articles as there are pockets in a container, stack forming members at the outlet ends of said channels, and common sets of rods for actuating said stack forming members.

15 7. In a device according to claim 6, in which said stacking device comprises a movable plunger operable to hold the articles against a side thereof, a common main shaft and adjustable movement transmission members for controlling the movements of said stack forming members of said stacking device as well as the movements of said plunger and said retaining flap.

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