Feb. 23, 1960 E. WALTHER ET AL 2,925,694

PACKAGE FILLING

Filed Jan. 19, 1954 5 Sheets-Sheet 1

Fig. 1

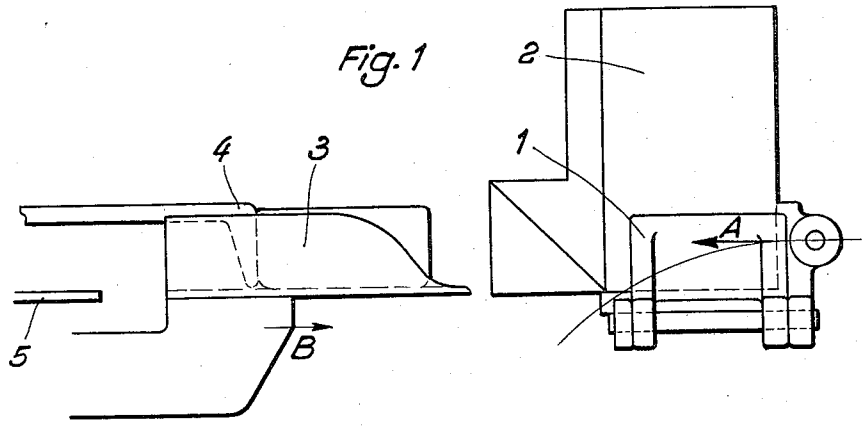



Fig. 2

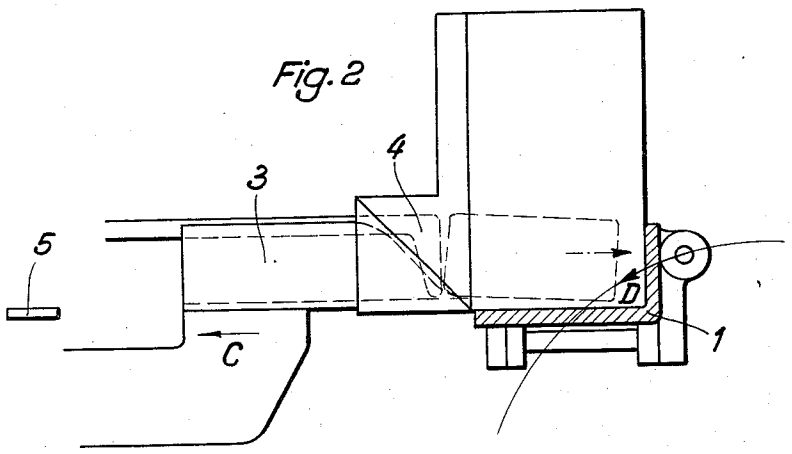
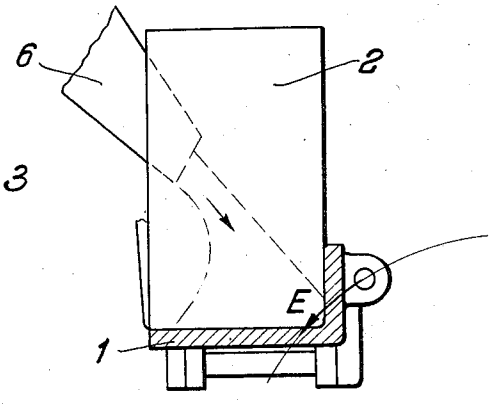



Fig. 3




Inventors:
ERHARDT WALTHER
WERNER DÄMMIG

Bailey, Stephens & Huettig
ATTORNEYS

Feb. 23, 1960 E. WALTHER ET AL 2,925,694

PACKAGE FILLING

Filed Jan. 19, 1954 5 Sheets-Sheet 2

Fig. 4

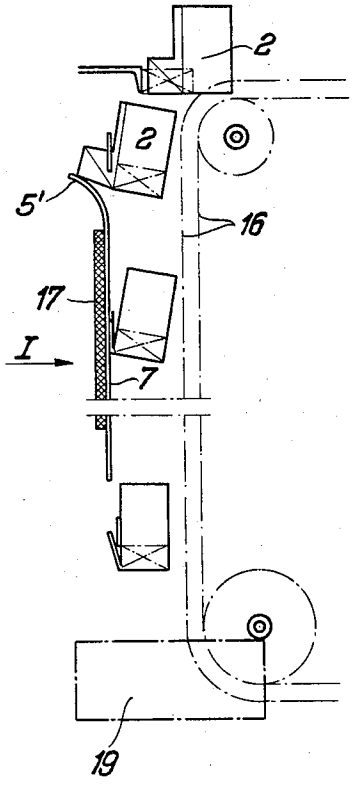
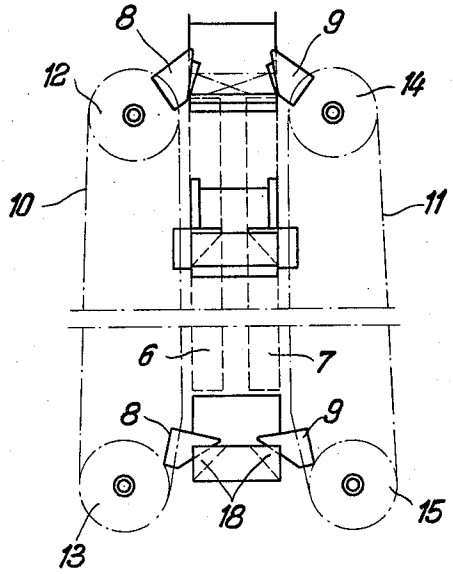



Fig. 5




Inventors:
ERHARDT WALTHER
WERNER DÄMMIG
Bailly, Stephens & Huettig
ATTORNEYS

Feb. 23, 1960 E. WALTHER ET AL 2,925,694

PACKAGE FILLING

Filed Jan. 19, 1954 5 Sheets-Sheet 3

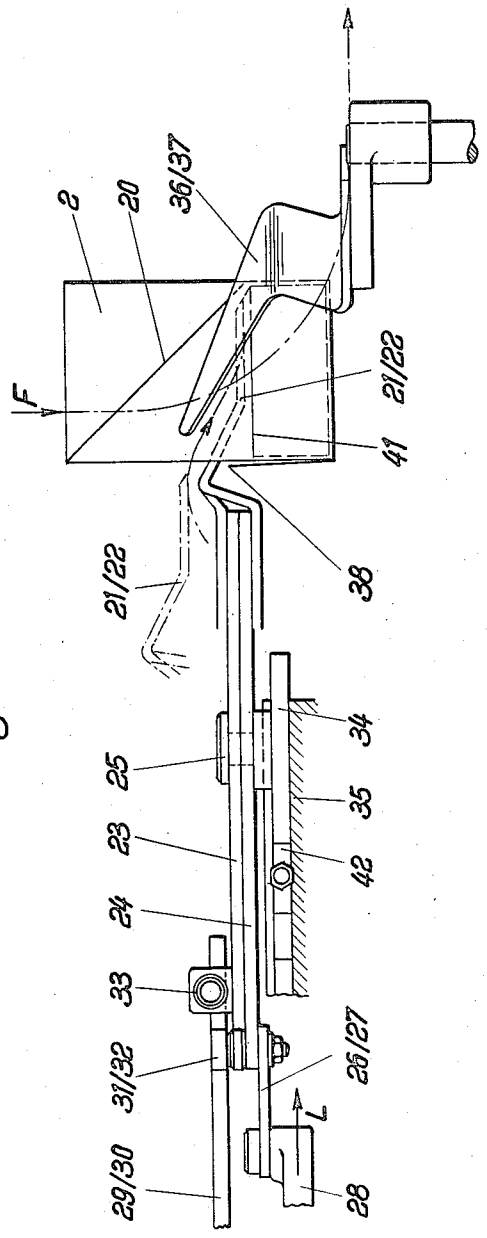



Fig. 6

Inventors:
ERHARDT WALTHER
WERNER DÄMMIG

Bailey, Stephens & Hiett
ATTORNEYS

Feb. 23, 1960 E. WALTHER ET AL 2,925,694

PACKAGE FILLING

Filed Jan. 19, 1954 5 Sheets-Sheet 4

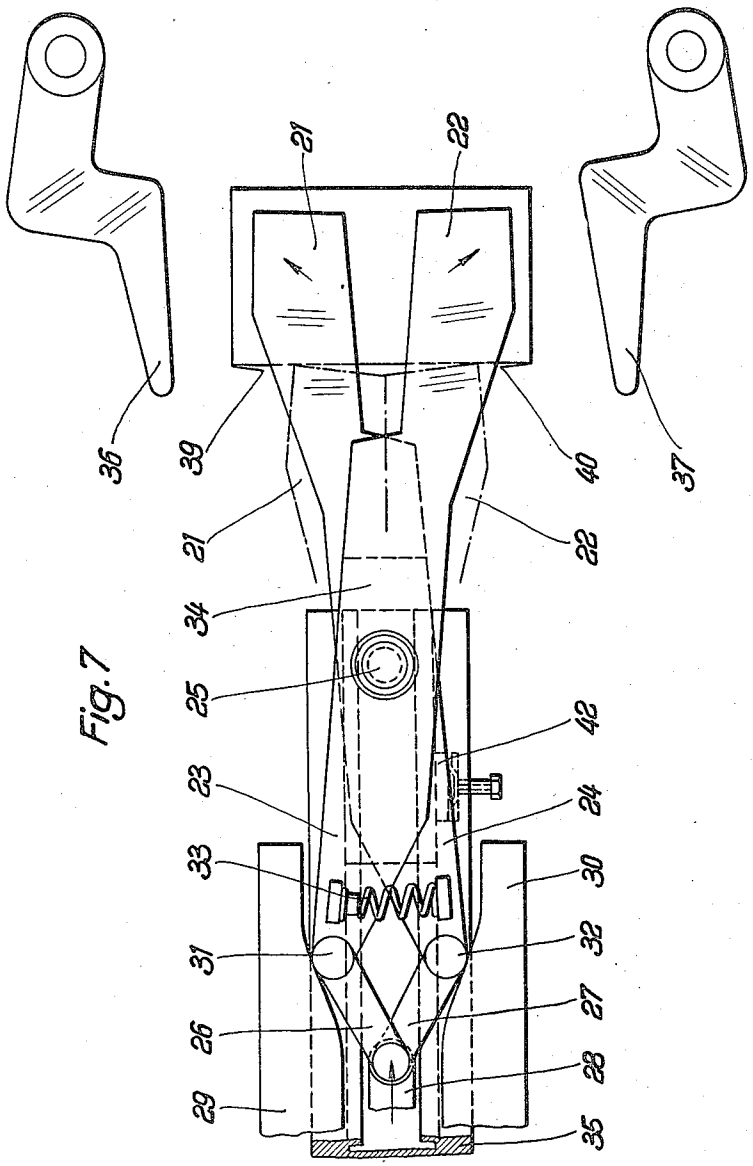



Fig. 7

Inventors:
ERHARDT WALTHER
WERNER DÄMMIG
Bailey, Stephens & Hunting
ATTORNEYS

Feb. 23, 1960 E. WALTHER ET AL 2,925,694

PACKAGE FILLING

Filed Jan. 19, 1954 5 Sheets-Sheet 5

Fig. 8

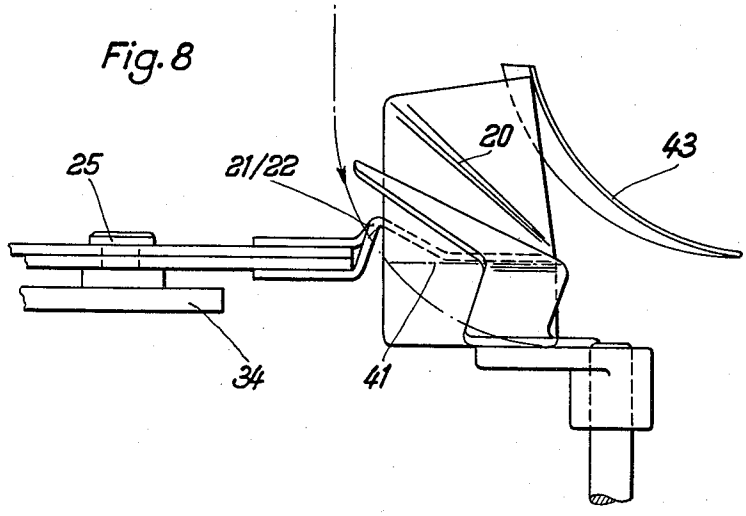
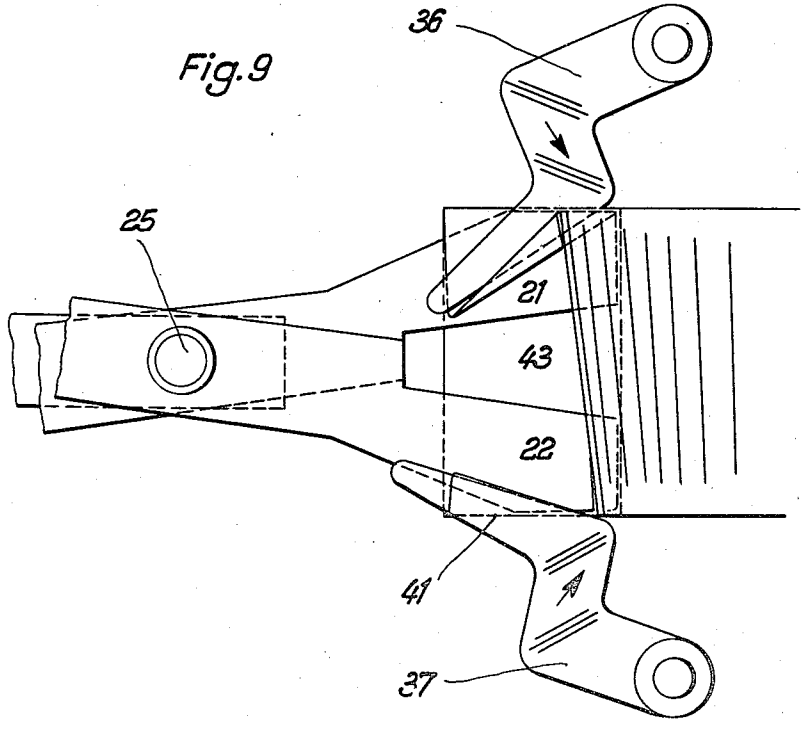



Fig. 9




Inventors:
ERHARDT WALTHER
WERNER DÄMMIG
Bailey, Stephens & Hiettig
ATTORNEYS

United States Patent Office 2,925,694
Patented Feb. 23, 1960



2,925,694

# PACKAGE FILLING

Erhardt Walther and Werner Dämmig, Forchheim, Oberfranken, Germany

Application January 19, 1954, Serial No. 404,996

Claims priority, application Germany February 3, 1953

6 Claims. (Cl. 53—37)

The invention relates to a process and a means for the filling and closing of folding boxes or folding packages.

The process according to the invention differs from known processes mainly in that the opened box or package moves towards the filling material and before, during or after the filling is subjected to a change of movement and is then closed.

According to one embodiment of the new process the opened box and the filling arrangement are moved towards one another and the filling material is pushed by means of a plunger from the filling means into the box which is then partly or completely closed as the case may be, by a change of movement and/or guided to a closing means. With this example, the counter movement of the filling means along with the filling plunger and the opened box takes place advantageously so far that filling means and filling plunger penetrate into the box whereupon then the filling means moves back and thus by means of the plunger the filling material is pushed into the box. The plunger is then drawn back and the box now filled, is partly or completely closed by means of change of movement and/or guided to a closing means.

This embodiment of the new process is advantageously used if the box is to be filled with material in layers, for example, biscuits and the like.

If the box is filled with pourable material then the process in the sense of the invention is such that the opened box is passed under a filling hopper and at that moment is fed from the hopper whereby the change of movement can also take place before or during the filling process. The filled package is then led to a closing means.

Closer details of the invention and above all the closing devices formed according to the invention are evident from the following description of the embodiment illustrated in the drawing, in which,

Fig. 1 shows a side view of a package held open by a gripper and the filling means before filling,

Fig. 2 is a side view of the parts according to Fig. 1 during the filling,

Fig. 3 is a side view of a gripper together with package and filling hopper in the filling position,

Fig. 4 is a side view of a front closing station,

Fig. 5 is a view of Fig. 4 in the direction of the arrow I,

Figs. 6 and 7 are a side view and a plan of the tools out of the working position of a lid closing station and,

Figs. 8 and 9 are a side view and a plan of the tools of Figs. 6 and 7 in the closing position.

According to Figs. 1 and 2 the package 2 opened above and held at the front by the gripper 1 moves in the direction of the arrow A towards the filling means which consists of a filling chute 3 or the like and a filling plunger 4. The filling chute 3 is filled by means of the plunger 4 which pushes the filling material from the table 5 onto the filling chute 3. The filling chute 3 and the



filling plunger 4 move then in the direction of the arrow B towards the package 2 moving in the direction of the arrow A. With the counter movement the filling chute 3 and the filling plunger 4 reach into the package 2. When the filling chute 3 has penetrated far enough into the package 2 its movement reverses (Fig. 2) and it then moves again out of the package 2 in the direction of the arrow C whilst the filling plunger 4 pushes the filling material, for example, layered biscuits, completely into the package 2. Then the filling plunger 4 likewise returns to its starting position.

After the filling has taken place the direction of running of the gripper 1 together with the package 2 changes, as indicated by the arrow D in Fig. 2. After completion of the change of direction the closing of the fully grooved open front side takes place. For this purpose the filled package reaches a front side closing station of which one example is reproduced in Figs. 4 and 5.

As can be seen in Fig. 4 the filled package 2 moves with its gripper vertically downwards. On this downwardly directed path the open front side strikes against the upwardly bent part 5' of a folding rail whereby the package is easily tipped backwards. In the example two such folding rails 6, 7 are arranged near one another. At the same time as the tipping up of the front part of the open front side of the packing 2 on the bent upper ends 5 of the folding rails 6, 7, continuously moved folding plates 8, 9 at both sides of the package are pivoted inwardly against the side parts of the front to be folded. These folding plates 8, 9 are on endless chains 10, 11 or the like located at both sides of the supply path of the package. These chains 10, 11 run over wheels or rollers 12, 13, 14, 15. The rollers 13 and 15 lie under the rollers 12, 14 and in such a manner that the vertical planes through their axes are moved outwards parallel to the vertical planes which go through the axes of the rollers 12, 14. The chains 10, 11 rotate at the same speed as the packages 2 are moved so that the folding plates 8, 9 neither speed up nor slow down the packages. The folding of the side parts by the folding plates 8, 9 takes place therefore at the top of the bent upper end 5' of the folding rails 6, 7 when the folding plates are swung forward against the package. The packages 2 then run through the space between the folding rails 6, 7 and the gripping chain 16 on which the gripper is located. Thus it reaches, as can be seen in Fig. 4, a bearing member 17 whereby the fastening together of the triangular shaped folded corners 18 of the side parts with the front side takes place. After passing the folding rails 6, 7 the package becomes vertical again.

The chains 10, 11 carrying the folding plates 8, 9 are diverted outwards behind the lower end of the folding rails 6, 7 in the direction of the rollers 13, 15. This position can be seen in Fig. 5. As a consequence of this deviation which may be effected by suitable means of known kind, the folding plates 8, 9 are moved slowly out from the fold so as then to free completely the package which is then led to the lid folding or closing station 19.

The closing tools in operation here and their manner of operation can be seen from Figs. 6–9. For the sake of clarity the grippers which hold the packages are omitted here. The packages 2 come in the direction of the arrow F (Fig. 6) from the front side closing station according to Figs. 4 and 5 and move in this direction to the lid closing means which, in order to be able to effect the fold running in the direction of the diagonals 20, has two spreading fingers 21, 22 which cut over one another scissors-like with their arms 23, 24. The arms 23, 24 are rotatably connected to one another by means of a bolt 25. Their rear ends are rotatably connected to a rod 28 over links 26, 27. At both sides of the arm ends,

guides 29, 30 are provided on which the arms 23, 24 are guided by means of rollers 31, 32. Between the arms 23, 24 there is a spring 33 which causes the arms to lie always with their guide rollers 31, 32 against the guides 29, 30.

The bolt 25 which connects the arms 23, 24 rotatably to one another is located in a flat slide 34 which is guided in a guide 35.

The spreading fingers 21, 22 are, as shown in the drawing, of trapezoidal shape. At both sides of the spreading device are folding fingers 36, 37.

The packages 2 coming in the direction of the arrow F are so made that their front wall ends are at 38 (Fig. 6) and 39, 40 (Fig. 7). The remaining front side is open. The spreading fingers 21, 22 are, before the introduction into the package, in the position shown dotted in Fig. 7. When they are introduced into the package then the rod 28 moves in the direction of the arrow L whereby the spreading fingers are moved to the right (Fig. 7), and penetrate into the package. With this pushing movement the rollers 31, 32 in consequence of the spreading movement of the arms 23, 24 effected by the spring 33, run on the curved paths of the guides 29, 30 outwards whereby the arms 23, 24 turn on the bolt 25 and move the spreading fingers apart which lie with their right-angled outer edges against the grooved fold edges 41. Then the folding fingers 36, 37 fold the upright side parts of the package 2 outwards along the creases 20, 41. When the fold is far enough then the rod 28 reverses its movement and draws the spreading fingers 21, 22 towards one another as well as out of the package. The friction resistance of the slide 34 on returning is increased so much by the brake piece 42, that the links 26, 27 draw the spreading fingers towards one another and then out of the package. The package is, on its further movement, completely closed by means of the folding wall or folding tongue 43.

As can be seen from Figs. 8 and 9 the fold wall 43 is so bent that it points upwards and covers the ends of the spreading fingers 21, 22 when they have their extreme spread out position. In addition the side turned towards the package runs obliquely to the folding wall and the folding fingers 36, 37 work at the time somewhat after one another so that they lay the folded triangular parts over or in one another.

The introduction of the spreading fingers takes place during the change of direction of the gripper 1 from the vertical to the horizontal direction. The plunger 34 makes a horizontal movement during the introduction. It is moved by means of a curved guide (not shown).

If the package 2 is to be filled with pourable material instead of material in layers, then it comes, as can be seen in Fig. 3, with the upright front side to the filling point where a filling hopper 6 is provided from which at the moment when the package passes by or under it, the pourable material is filled in an accurately measured quantity. The change of movement of the package 2 in the direction of the arrow E by means of which it is led to the closing station may be introduced before, during or after the filling process.



We claim:

1. A process for the continuous filling and closing of containers having opened closure flaps comprising simultaneously advancing both the filling material and a line of containers toward each other in alignment in the same horizontal plane, inserting filling material into each container as the container is exposed to the filling material, and then moving the container vertically downward while closing at least some of the closure flaps.

2. A process as in claim 1, further comprising inserting the filling material by means of a plunger which advances toward the container while the container is also advancing toward the plunger.

3. A process as in claim 2, further comprising first inserting a filling chute into said container, then inserting the filling material by said plunger, next withdrawing said chute, and finally withdrawing said plunger.

4. A process as in claim 3, further comprising folding certain of the side flaps by folding means which travels along with and at the same speed as the container.

5. A process as in claim 4, further comprising first folding said certain side flaps by said folding means, and then folding a front flap before removing said folding means.

6. A process as in claim 5, further comprising spreading other side flaps by fingers inserted in the container, partially folding said other side flaps with folding fingers, and then completing the fold by pressing the top flap against a wall.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,628,803 | Pinter | May 17, 1927 |
| 2,449,478 | Herzog | Sept. 14, 1948 |
| 2,586,006 | Conti | Feb. 19, 1952 |
| 2,640,305 | Genco et al. | June 2, 1953 |
| 2,651,896 | Woodruff et al. | Sept. 15, 1953 |
| 2,671,588 | Vogt | Mar. 9, 1954 |
| 2,721,018 | Heavin | Oct. 18, 1955 |
| 2,756,553 | Ferguson et al. | July 31, 1956 |
| 2,775,082 | Vogt | Dec. 25, 1956 |