Dec. 8, 1953 R. H. WINTERS 2,662,017

METHOD FOR FILLING CONTAINERS

Original Filed Feb. 11, 1947 4 Sheets-Sheet 1

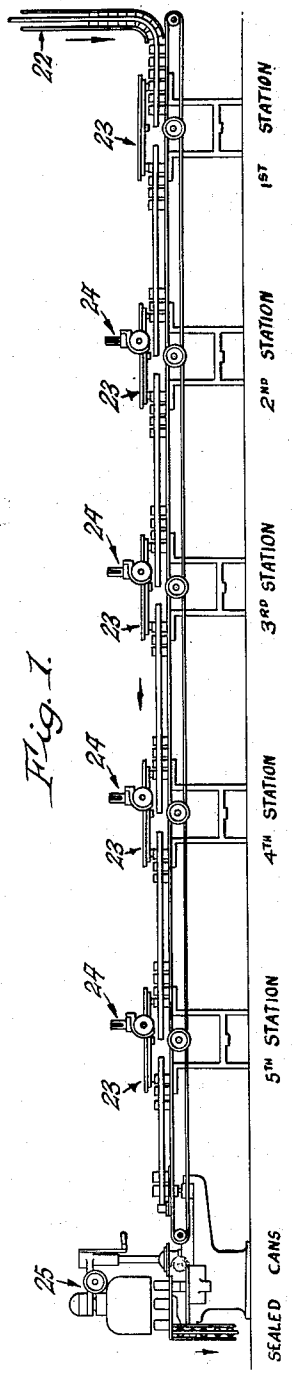


Fig. 1.

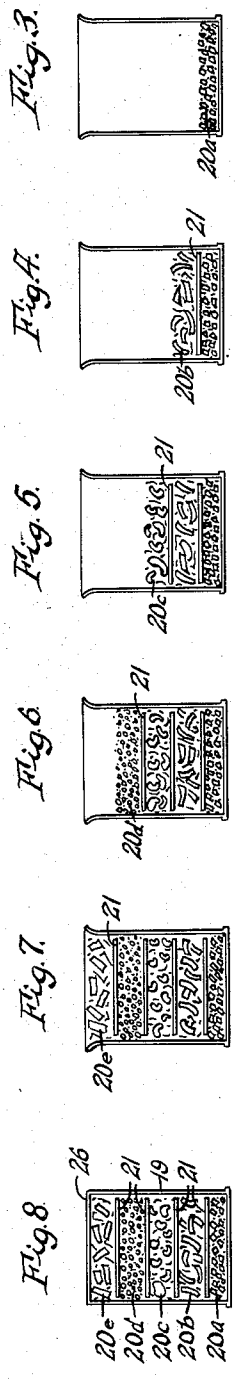


Fig. 3. Fig. 4. Fig. 5. Fig. 6 Fig. 7. Fig. 8.

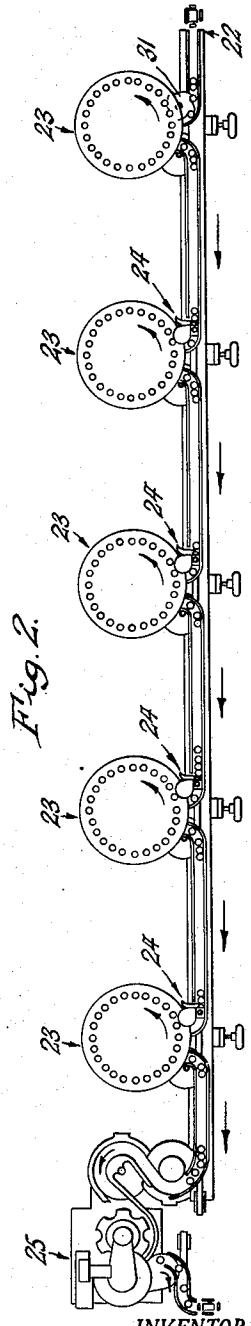


Fig. 2.

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Fig. 9.

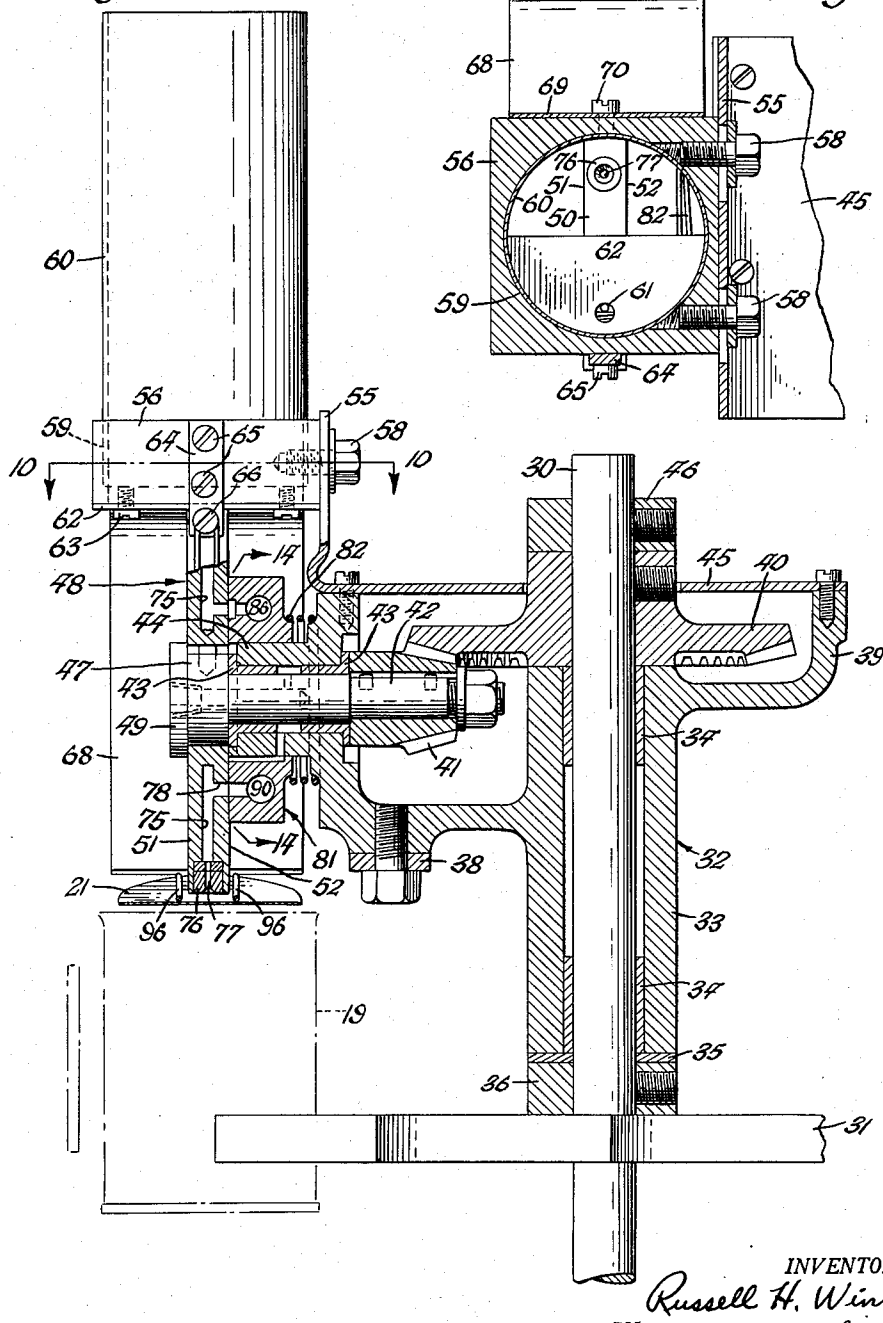


Fig. 10.

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Fig. 12.

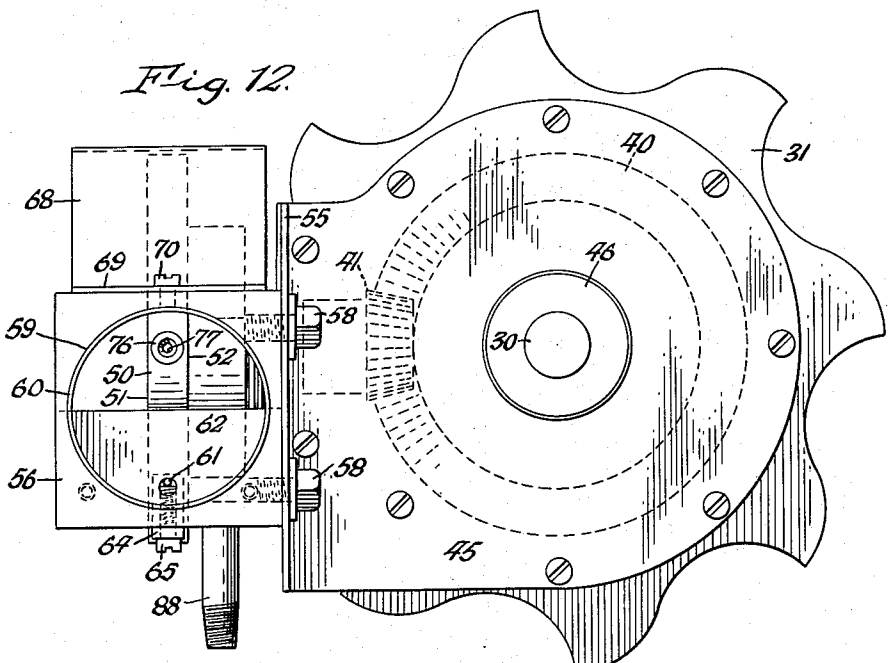


Fig. 14.

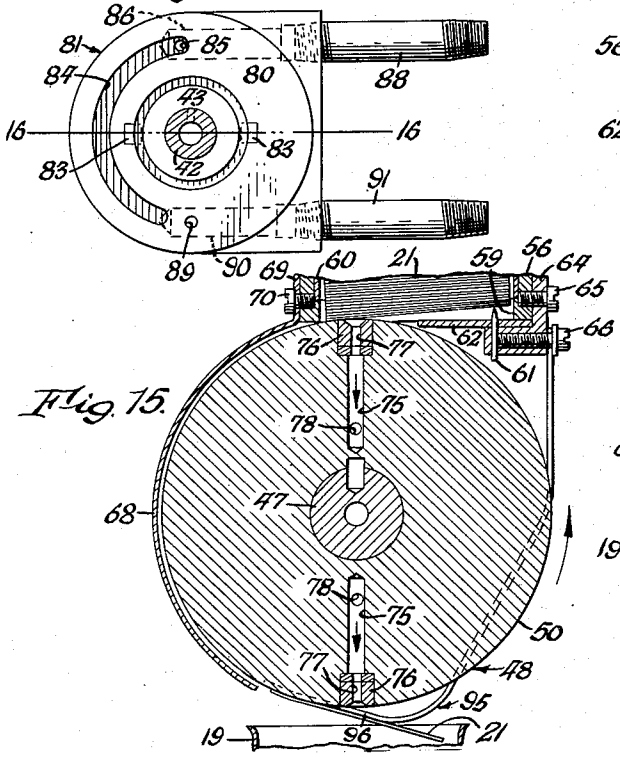
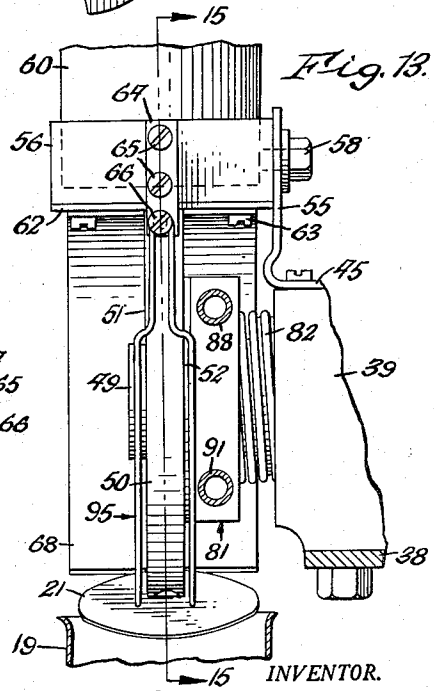


Fig. 15.

Fig. 13.



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Fig. 11.

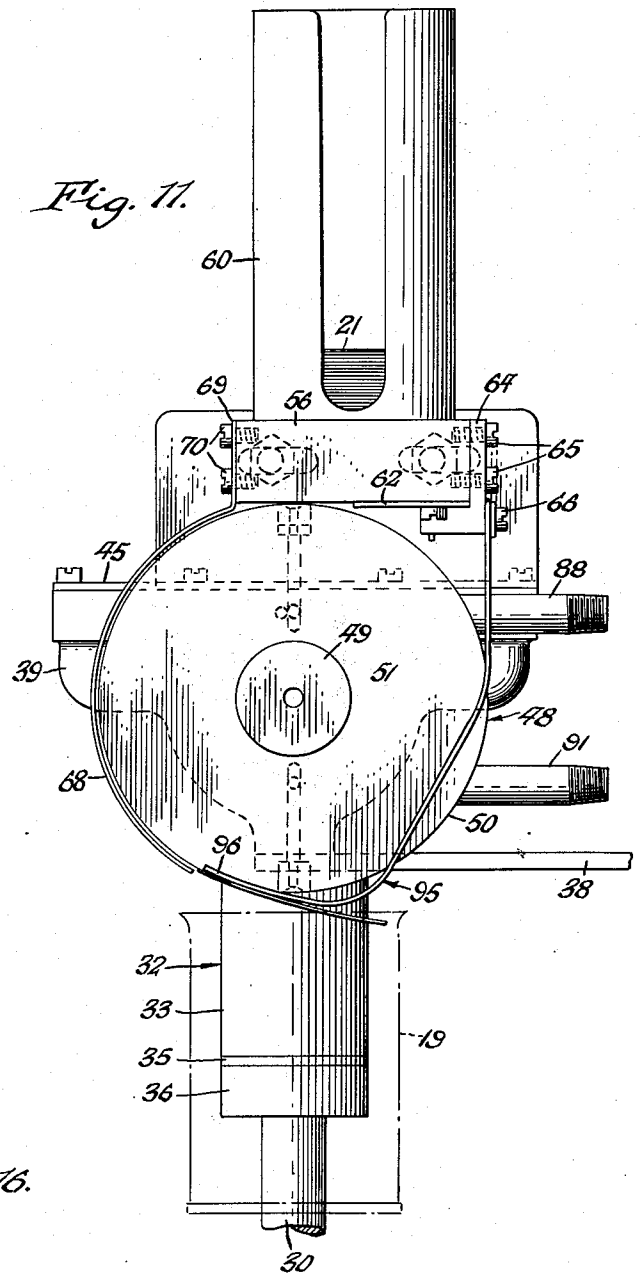
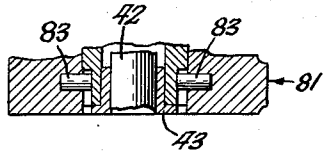


Fig. 16.



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UNITED STATES PATENT OFFICE

2,662,017

METHOD FOR FILLING CONTAINERS

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Original application February 11, 1947, Serial No. 727,796. Divided and this application December 1, 1950, Serial No. 198,600

1 Claim. (Cl. 99—171)

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This invention relates to a method for filling containers and more particularly to a method for filling a procession of containers with a plurality of layers of materials separated by sheet material pieces.

This application is a division of my copending application now issued as Patent No. 2,558,028 entitled Apparatus for Filling Containers.

The principal object of the present invention is to provide such a method which alternately deposits a layer of different foodstuffs and sheet material pieces into the containers so that the various layers of foodstuffs are maintained separate from each other. Thus relatively small amounts of different foodstuffs are packed in a single container from which the various layers can be separately removed and used in any desired manner, such as, for example, to form an attractive salad or garnish.

An important object of the present invention is to provide such a method which is adapted to a continuous high speed can filling operation and in particular is adapted for use in a single line in which the alternate operations of filling the cans with the different foodstuffs and inserting parchment paper separators is arranged in proper sequence to render this type of pack commercially practicable.

Another object of the invention is to provide such a method in which the successive cans are uniformly provided with the same proportions of the different foodstuffs and in which the several layers are uniformly provided with parchment paper separators arranged therebetween.

Another aim of the invention is to provide such a method which operates with a minimum of hand labor and supervision.

Other objects and advantages of the invention will appear from the following description and accompanying drawings in which:

Fig. 1 is a side elevation of a can filling and sealing line and showing the successive stations at which the cans are packed with layers of foodstuffs and receive parchment paper separators in accordance with this invention.

Fig. 2 is a top plan view thereof.

Figs. 3–8 are vertical sections through a can being filled in accordance with the present invention, these figures being arranged with reference to Figs. 1 and 2 so as to illustrate the successive operations performed at the various stations of the can filling line.

Fig. 9 is a vertical fragmentary section, partly in elevation, of one of the devices for dispensing the parchment paper separators into the can.

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Fig. 10 is a fragmentary horizontal section taken on line 10—10, Fig. 9.

Fig. 11 is a front elevation of the same.

Fig. 12 is a top plan view thereof.

Fig. 13 is a fragmentary side elevation thereof viewed from the same direction as in Fig. 9.

Fig. 14 is a fragmentary vertical section taken on line 14—14, Fig. 9.

Fig. 15 is a fragmentary vertical section taken on line 15—15, Fig. 13.

Fig. 16 is a fragmentary horizontal section taken on line 16—16, Fig. 14.

In the practice of the present invention the cans are filled and sealed in the manner illustrated in Figs. 3–8, inclusive, these figures illustrating the sequence of material filling and disk-laying operations. The can 19, filled and sealed as illustrated in Fig. 8, is shown as containing five separate layers 20*a–e* inclusive of different foodstuffs and with a parchment paper separator 21 interposed between adjacent layers. These layers and parchment paper separators are inserted in each can in the manner illustrated in Figs. 3–7 by apparatus shown in the filling line, Figs. 1 and 2.

Referring more particularly to Figs. 1 and 2, the numeral 22 represents a vertical canway which feeds a succession of empty cans open at one end to a can-filling line having a number of stations at which the cans are successively filled with relatively small predetermined amounts of different foodstuffs so as to form layers with parchment paper separators arranged therebetween. At each station the line of cans is diverted into a can filler, indicated generally at 23, which can be of any suitable conventional automatic or semi-automatic type for depositing a predetermined quantity of foodstuffs into each passing can. At each station, with the exception of the first station, a parchment paper separator 21 is inserted into each can prior to the insertion of the layer of foodstuffs at that station, the insertion of these parchment paper separators being effected by a device indicated generally at 24. The construction and operation of each of these devices is illustrated in Figs. 9–16 inclusive. Following the last station the line of cans is admitted to a can sealing machine, illustrated generally at 25 and which can be of any conventional type.

At the first filling station the empty open-top can 19 is filled with the first layer 20*a* of foodstuffs as illustrated in Fig. 3, by the can filler 23 at this station. From this first station the line of cans proceeds to the second station

where a parchment paper separator 21 is first dropped into each can on top of the layer 20a by the device 24 at this station, following which the second layer 20b of foodstuffs is deposited on top of this parchment paper separator by the filler 23 at this second station. The partly filled can as it leaves the second filling station is illustrated in Fig. 4.

The procedure at the second station is repeated at the third, fourth and fifth filling stations, the line of cans progressively passing through or by these filling stations at each of which a parchment paper separator 21 is first dropped into the can on top of the uppermost layer therein by the device 24 at each of these stations, following which a layer of foodstuffs is deposited on top of this parchment paper separator 21 by the filler 23 at each of these stations. In Figs. 5, 6 and 7 is illustrated the condition of each can leaving, respectively, the third, fourth and fifth filling stations. Following the fifth station the line of cans enters the can sealer 25 in which a top 26 is applied to the open end of the can to provide a sealed closure therefor.

The apparatus for dropping a parchment paper separator 21 into each of the passing cans at the second, third, fourth and fifth filling stations is illustrated in Figs. 9–16. This device is mounted on the upward extension of the vertical shaft 30 of the can filler which carries the can feed star wheel 31 which feeds the line of cans 19 into the can filler. The device comprises a frame member 32 having a tubular part 33 surrounding the upward extension of the rotating shaft 30 and provided with bearing bushings 34 between this tubular part 33 and the shaft 30. At its lower end this tubular part 33 of the frame member 32 is supported on a thrust bearing disk 35 which in turn is supported upon a collar 36 fast to the shaft 30 immediately above the can feed star wheel 31. The frame member 32 is prevented from rotating with the shaft 30 in any suitable manner as by the provision of a strap 38 which can be attached to any stationary part of the can filler adjacent the device. The upper part of the frame member 32 is formed to provide a gear box 39 for a bevel gear 40 fast to the shaft 30 and meshing with a bevel pinion 41 fast to a horizontal stub shaft 42 which is journaled in bushings 43 mounted in a neck 44 projecting laterally from one side of the gear box, as best illustrated in Fig. 9.

The gear box is shown as covered by a horizontal top plate 45 which can be secured in any suitable manner, and a retaining collar 46 is also shown as secured to the upper end of the shaft 30 immediately above the hub of the bevel gear wheel 40 which projects upwardly through an opening provided in the top plate 45.

The outer end of the horizontal stub shaft 42 is enlarged, as indicated at 47, and on this enlargement is nonrotatably mounted a rotor 48, this rotor being preferably retained on the enlargement 47 by an integral end head 49 on the stub shaft 42. The rotor 48 is in the form of a disk having a cylindrical but relatively narrow periphery 50 and flat radially extending sides 51 and 52.

The rotor 48 is provided with means for removing or stripping off the lowermost parchment paper separator from a stack of separators arranged in an overhead magazine, which magazine is preferably constructed as follows: The cover 45 for the gear box 39 is formed on the side adjacent the rotor to provide an upstanding flange 55. A base block 56 is secured to this upstanding flange 55 by means of screws 58, or in any other suitable manner, this base block being provided with a vertical stepped bore 59 in which is removably inserted an open-ended cylinder 60, the lower end of which is supported on the step of this stepped bore 59. A stack of the parchment paper separators 21, each of which is in the form of a thin flat disk, is contained in the cylinder 60, the lowermost parchment paper separator 21 of this stack resting at one side on the periphery 50 of the rotor 48, as best shown in Fig. 15. The other side of this lowermost parchment paper separator 21 is supported at a higher elevation upon a pin 61 which extends upwardly through a semi-circular bottom plate 62 which closes off half of the bottom of the stepped bore 59 of the base block 56. This semi-circular plate 62 is shown as secured to the bottom of the base block 56 by screws 63 and the pin 61 is shown as supported by an L-shaped block 64, having an upstanding part which is secured to the adjacent side of the base block 56 by screws 65, as best shown in Figs. 11 and 15. The pin 61 is shown as held in the L-shaped block 64 by means of a set screw 66 and which permits adjustment of the elevation of the upper end of this pin.

The parchment paper separator 21 stripped off from the bottom of the stack contained in the base block 56 and magazine cylinder 60 is protectively guided on the periphery 50 of the rotor 48 in its movement along with this rotor by a semi-circular metal shield 68 which embraces the downwardly moving side of this rotor and is arranged in closely spaced relation to its periphery 50, as best shown in Fig. 15. The upper end of this semi-circular shield can be secured to the base block 56 in any suitable manner as by the upstanding ear 69 provided thereon and attached to the side of the base block 56 by the screws 70. The semi-circular shield 68 is shown as being of sufficient width to shroud each passing disk and prevent it from being displaced or crumpled during any part of its travel with the periphery 50 of the rotor 48.

The lowermost parchment paper separator 21 is stripped by the rotor from the overhead stack by means of vacuum. For this purpose the rotor 48 is provided on diametrically opposite sides with a pair of radially extending passages 75, the enlarged outer ends of which open to the periphery 50 of this rotor. In the enlarged outer end of each of these passages 75 is arranged a rubber nipple 76 of soft frictional material such as rubber, which preferably projects a slight amount radially outwardly from the periphery 50 of the rotor and is provided with a central bore 77 leading from its outer face to the radial passage 75 of the rotor 48. Adjacent its inner end each radial passage 75 communicates with a lateral passage 78 leading to the flat face 52 of the rotor.

This flat face 52 is engaged by a flat face 80 of a valve member 81, this valve member being generally in the form of a disk and slidingly mounted on the neck 44 of the gear box 39 and being urged into engagement with the flat face 52 of the rotor by a helical compression spring 82. This valve member 81 is shown as held against rotation by a pair of keys 83 which connect this valve member to the stationary neck 44 of the gear box 39, as best shown in Figs. 14 and 16. A semi-circular or arcuate groove 84 is provided in the flat face 80 of the valve member 81, this groove being concentric with the axis of rotation of the rotor 48 and being arranged

to register with the passages 78 of the rotor 48 during the greater part of the downward movement of each of these passages 78. The upper end of the arcuate groove 84 is shown as communicating with a port 85 leading to a passage 86 which in turn leads to a vacuum line 88. This vacuum line 88 can be connected to any suitable vacuum source (not shown) to maintain a vacuum in the arcuate groove 84.

Beyond the extreme lower end of the arcuate groove 84 a port 89 is provided in the flat face 80 of the valve member 81, this port being adapted to communicate with the passages 78 of the rotor 48 and being in communication with a passage 90 connecting with a line 91. This line 91 can be open to the atmosphere or can be connected to any suitable source (not shown) of compressed air.

In order to insure proper deposit of each parchment paper separator 21 by the rotor 48 into the can 19 being conveyed by the can feed star wheel 31, a stationary stripping device, indicated generally at 95, is provided. This stripping device is shown as being in the form of a piece of wire which is secured at its upper end to the L-shaped block 64 by the screw 66 and the ends of which extend downwardly on opposite sides of the rotor 48. Each of these wire ends extends downwardly along the rising side of the rotor 48 to a position below the lowermost extremity of this rotor and immediately above the open end of the can 19 passing thereunder. The extremity 96 of each of these wire ends is bent upwardly to lie alongside the descending side of the rotor 48 immediately adjacent its periphery and is preferably arranged substantially tangential to this wheel, as best shown in Figs. 11 and 15. These extremities 96 thereby provide downwardly extending strippers which serve to insure the removal of the parchment paper separator 21 from the rotor 48.

OPERATION

For the operation of the device the different materials to be filled into the cans are supplied to the can fillers 23 at each of the five stations illustrated in Figs. 1 and 2; a stack of parchment paper separators 21 is maintained in the cylindrical magazine 60 of each device 24 at the second, third, fourth and fifth stations and a line of cans is being conveyed successively through the can fillers 23 at each of the five stations to the can sealer 25. At the first station illustrated in Figs. 1 and 2, the line of cans 19 is diverted into a can filler 23 and the bottom layer 20*a* of foodstuffs is deposited in each can by this filler. The cans so filled with one layer 20*a* continuously pass to the second station where they are successively picked up by the can feed star wheel 31 of the can filler 23 at this second station.

The upward extension of the shaft 30 of this can feed star wheel 31 drives the bevel gear 40 which in turn drives the bevel pinion 41, stub shaft 42 and rotor 48. The periphery 50 of this rotor 48 is in wiping contact with the lowermost parchment paper separator 21 of the stack of these separators contained in the cylindrical magazine 60 and its supporting base block 56, this wiping contact being with the left hand side of this lowermost parchment paper separator as viewed in Fig. 15. The opposite side of this stack of parchment paper separators 21 is supported by the upper end of the pin 61 which projects upwardly through the semi-circular plate 62 at the bottom of the magazine. This pin serves to support the stack of parchment paper separators 21 in a slightly inclined position and with a minimum frictional contact with the lowermost separator of this stack so that this lowermost separator 21 can be stripped from the bottom of the stack by the rotor 48 with a minimum amount of force.

The lowermost parchment paper separator is so stripped from the bottom of the stack in the magazine by the rubber nipples 76 as they successively pass in contact with the bottom of the stack and which operate as vacuum nipples to seize the lowermost separator of the stack and to hold it to the rotor until it reaches a position above the open end of the can 19 being conveyed by the can feed star wheel 31, at which time the parchment paper separator is released to be deposited in this can. The removal of the lowermost parchment paper separator 21 from the bottom of the stack of separators arranged in the magazine 60 is facilitated by a slight radial extension of these rubber nipples 76 beyond the periphery 50 of the rotor.

To render the rubber nipples 76 operative as vacuum nipples along the descending side of the rotor 48, each vacuum nipple is provided with the passage 77 leading to the bore 76 and passage 78, this latter passage 78 opening to the flat face 52 of the rotor and being in communication with the arcuate groove 84 while the nipple is traversing the descending side of the rotor 48. This arcuate groove 84 is placed under vacuum through the bore 85, passage 86 and the vacuum line 88 which can be connected to any suitable form of vacuum device (not shown). The vacuum so produced in each rubber nipple 76 while traversing the descending side of the rotor 48 serves to hold the leading side of the parchment paper separator 21, stripped from the bottom of the stack, to the periphery 50 of the rotor and displacement or crumpling of this separator so being carried along the descending side of the rotor 48 is prevented by the wide semi-circular shield 68 which embraces the descending side of this rotor in close proximity to its periphery.

When the rubber nipple with a parchment paper separator 21 secured thereto by vacuum reaches the bottom of the rotor, this vacuum is relieved and, if desired, a puff of air under pressure can be supplied to the nipple at its lowermost position on the rotor to blow the leading end of the parchment paper separator 21 downwardly into the open end of the can 19 being conveyed thereunder by the can feed star wheel 31. For this purpose, when each rubber nipple 76 reaches the bottom of the rotor 48, its passage 78 comes into register with the port 89 of the stationary valve member 81. This port 89 is connected either to the atmosphere or to a source of compressed air (not shown) through the passage 90 and line 91 and hence at this time a puff of air, determined by the extent of registry of the passage 78 with the port 89 is admitted to the inverted rubber nipple 76 to so blow the parchment paper separator 21 from the rotor 49 into the can 19 arranged thereunder.

The stripping of the parchment paper separator 21 from the bottom of the rotor 48 is further facilitated by the stationary wire stripping fingers 96, these fingers straddling the ascending side of the rotor 48 and having reversely bent extremities which extend along the bottom of the descending side of the rotor 48 tangentially

to its periphery to effect a smooth stripping of each separator 21 therefrom.

It will be understood that a parchment paper separator 21 is dropped into each can being conveyed by the can feed star wheel 31 and that hence the rotation of the rotor 48 must be synchronized with the rotation of this can feed star wheel 31. To this end the can feed star wheel 31 is shown as having eight can pockets; a four-to-one ratio is provided by the bevel gears 40 and 41, and the rotor 48 is provided with two diametrically oppositely located rubber transfer nipples 76, as previously indicated.

It will further be noted that the helical compression spring 82 constantly urges the valve member 81 to the left, as viewed in Fig. 9, so as to insure an intimate contact between the flat face 80 of this valve member and the flat face 52 of the rotor 48.

The parchment paper separator 21 so dropped into each can at the second station falls flat on top of the first layer 20*a* of foodstuffs packed therein. The can feed star wheel 31 thereupon introduces this can into the can filler 23 at the second station where the second layer 20*b* of foodstuffs is deposited upon this parchment paper separator 21. In a continuous progression each of the cans in the line is so provided with a parchment paper separator 21 and a second layer 20*b* of foodstuffs at this second station, and this continuous progression of cans is conveyed to the third, fourth and fifth stations where the process performed at the second station is successively repeated. Each can is filled layer by layer with different foodstuffs and with a parchment paper separator 21 between adjacent layers until the can has been completely filled at the fifth station as illustrated in Fig. 7. From this fifth station the filled can passes to the can sealer 25 where its top 26 is applied and sealed.

From the foregoing it will be seen that the present invention provides a rapid process and apparatus for filling cans with layers of different

foodstuffs separated by parchment paper separators and which act in conjunction with a continuously moving line of cans so as to provide commercial capacity. It will further be seen that the mechanism illustrated in Figs. 9–16 for dispensing the parchment paper separators into the passing cans is of extremely simple construction considering the function which it performs, and operates rapidly and positively to drop a single parchment paper separator properly into each can without likelihood of crumpling the same.

I claim:

The high capacity continuous method of filling uniformly a procession of cylindrical containers with a plurality of separated layers of different foodstuffs, which comprises continuously moving the containers in said procession successively past a plurality of filling stations, depositing a predetermined amount of foodstuffs into each container as it passes each station, and intermittently dropping single parchment paper disks into the moving procession of containers at a location between the stations, the rate of dropping the disks being coincided with the movement of the containers whereby a disk is placed on the uppermost layer of each container at that particular location.

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