

May 10, 1960

R. V. BURT
PREMIUM FEEDER

2,935,827

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3 Sheets-Sheet 1

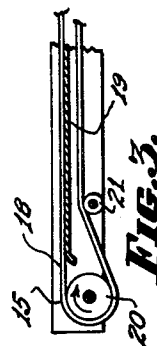
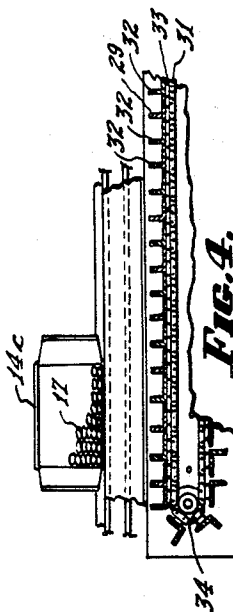
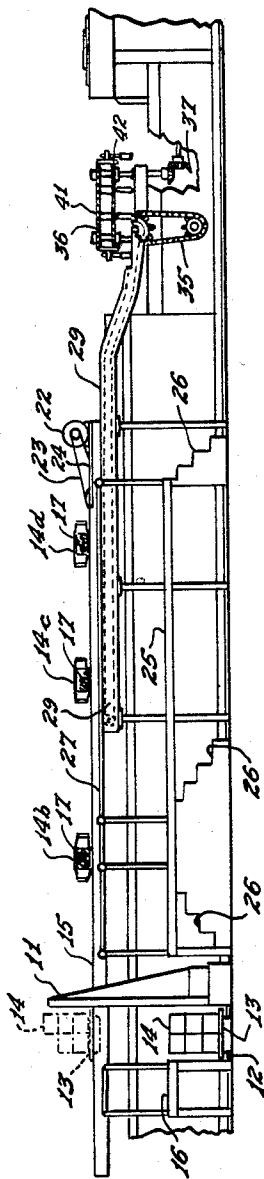
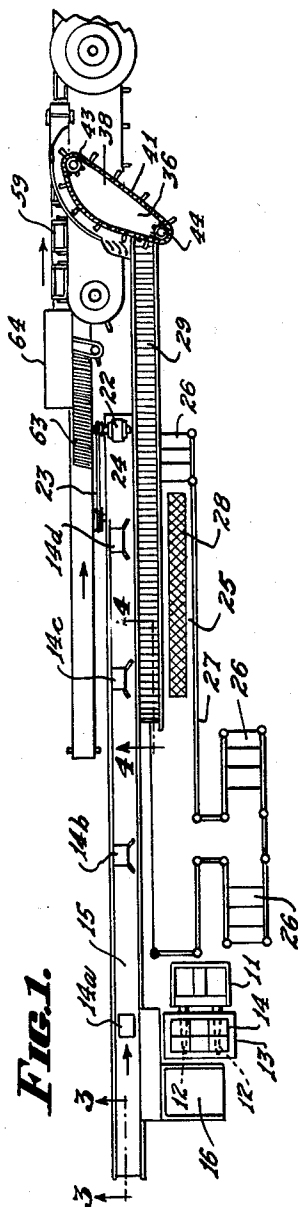


Fig. 1.

Fig. 2.

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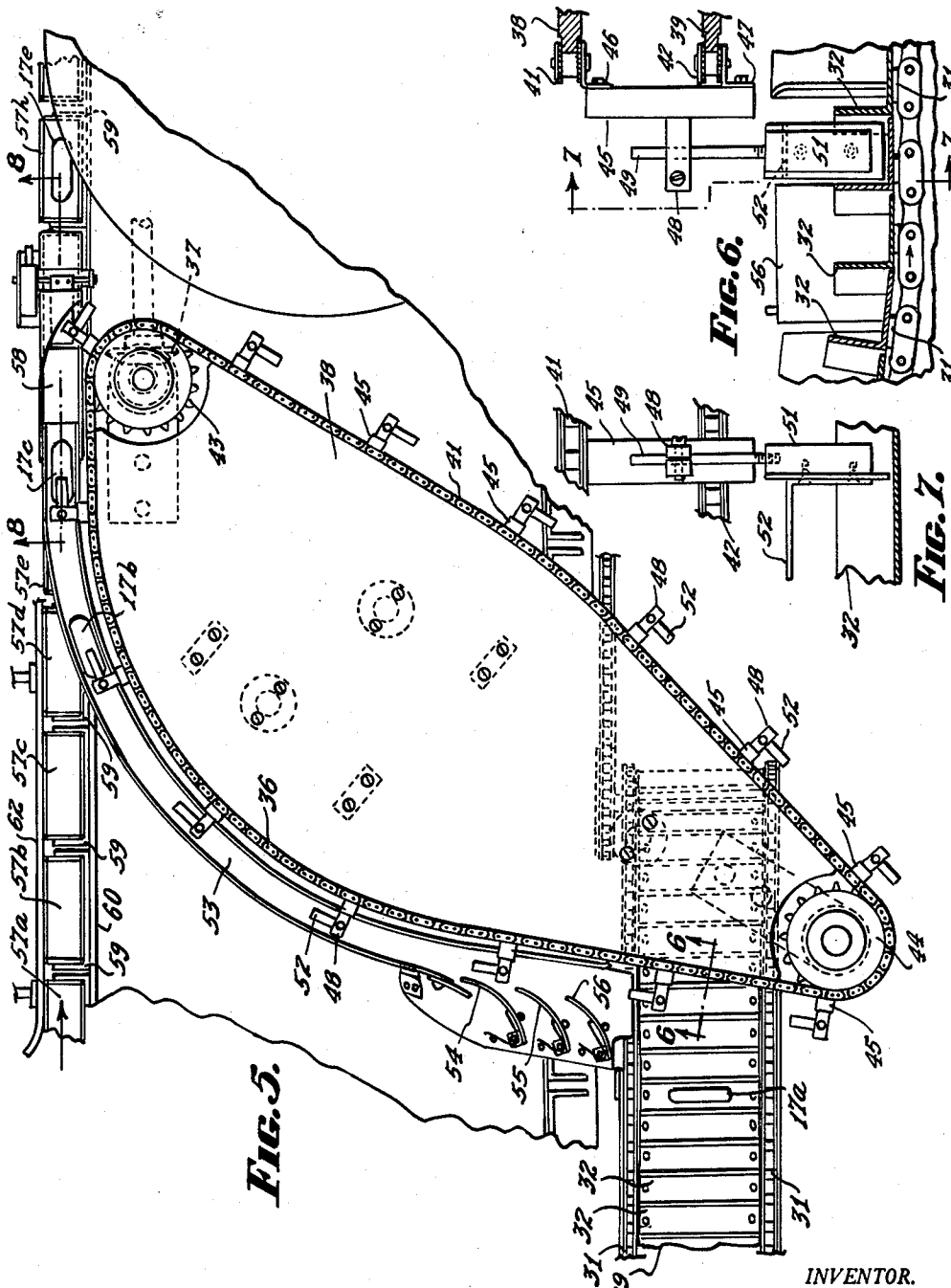
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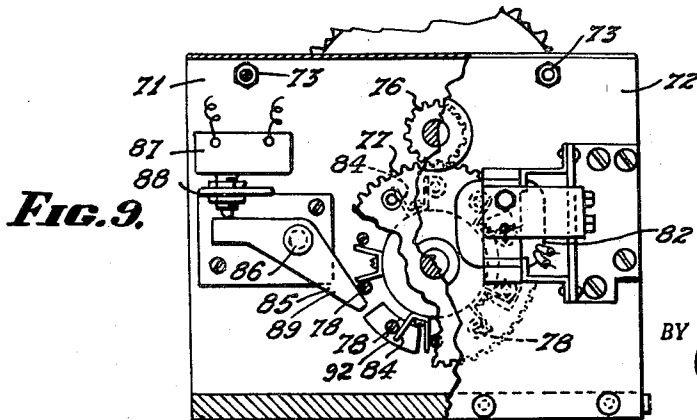
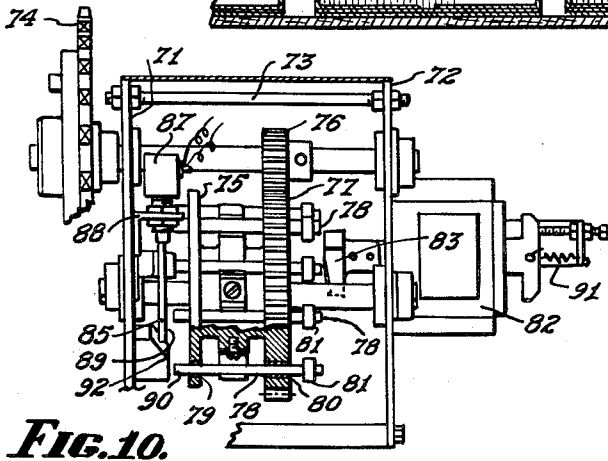
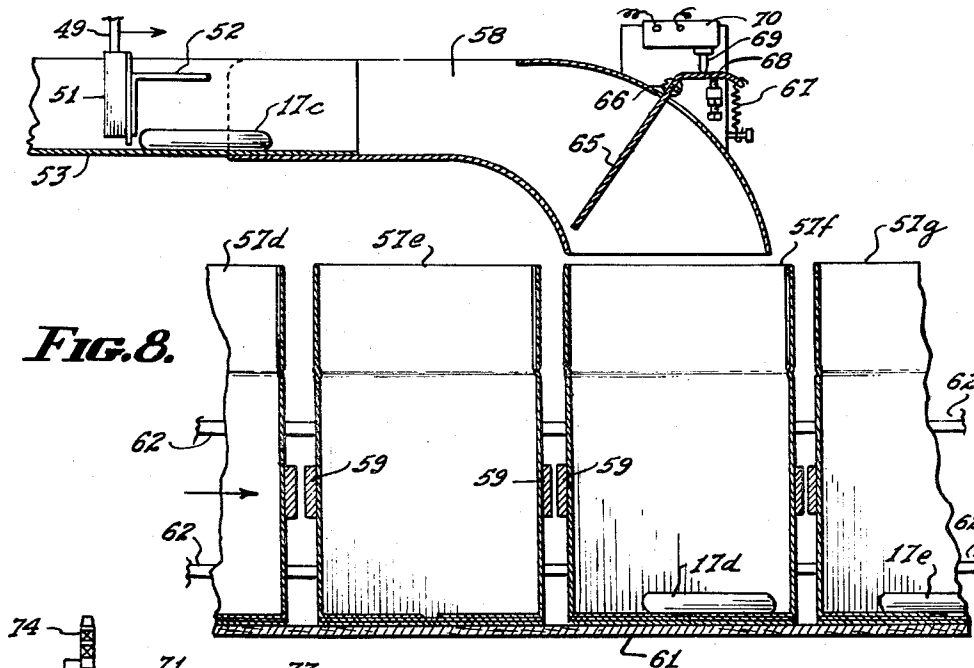
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3 Sheets-Sheet 3



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PREMIUM FEEDER

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6 Claims. (Cl. 53—60)

This invention relates to a device for continuously feeding and inserting premiums into the open end of successive cartons moving on a conveyor. The invention is particularly useful for feeding premiums of irregular sizes and shapes and by appropriate mechanical design can be adapted for use with premiums of any practical size or shape.

A common merchandising practice for commodities sold in cartons, such as soaps, detergents, cereals and the like, is to enclose a prize or premium intermingled with the contents of the carton. Various ways of inserting premiums have been used; but each has its inherent limitations. For example, premiums can be inserted in each carton manually before filling the carton with product. Obviously, such a method is very tedious, time consuming and impractical when attempting to package hundreds of thousands of cartons at high speeds to satisfy present day merchandising requirements. Machines have been devised for automatically inserting premiums into cartons; but these machines have each had serious limitations insofar as the size and shape of the premium that could be handled is concerned. Usually, these machines are large and bulky and cannot be installed in cooperation with product filling machines already in use without making extensive changes in the floor layout of the packaging machinery.

It is an object of the present invention to provide a premium feeder which will automatically feed a premium into the open end of each successive moving carton on a conveyor.

Another object of the present invention is to provide a premium feeding machine for use in conjunction with a filling machine operated at high filling rates, such as 300 cartons per minute.

Still another object is the provision of a premium feeder capable of feeding premiums or objects of irregular size or shape in which a change in the type of premium being fed does not require modification in the structure of the premium feeder.

A further object is the provision of a premium feeder which may be installed over an existing carton forming and product filling line without requiring additional floor space.

A still further object is the provision of sensing means operating in conjunction with the premium feeder and filling line for automatically removing a carton which inadvertently has not received a premium.

Briefly stated, the present invention contemplates the provision of a hoist for elevating a supply box of premiums to a belt conveyor which moves the box from the hoist to a loading station. Premiums are removed from the box at the loading station and inserted individually in adjoining buckets of a bucket conveyor wherein they are moved to a transfer conveyor. The transfer conveyor removes successive premiums from the bucket conveyor and pushes them through a trough to a discharge point where they are dropped by gravity into successive

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cartons. Means are provided for preventing a carton having no premium from being filled with product.

By way of example, the present invention has been used to feed premiums such as knives, forks, spoons, pencil boxes, hot pads, sewing kits, first aid kits, combs and piggy banks. The premium feeder can be designed and adapted to handle a premium regardless of size or shape.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter of the instant invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a plan view of the premium feeder of the instant invention;

Figure 2 is a side elevation of the premium feeder;

Figure 3 is a section taken along the line 3—3 of Figure 1 showing a portion of the belt conveyor;

Figure 4 is a section taken along the line 4—4 of Figure 1 showing a portion of the bucket conveyor;

Figure 5 is a plan view of the transfer conveyor showing its relationship to the bucket conveyor and the line of cartons being fed;

Figure 6 is a section taken along the line 6—6 of Figure 5 showing the position of a pusher member on the transfer conveyor with respect to the bucket conveyor;

Figure 7 is a section taken along the line 7—7 of Figure 6 showing a side elevation of a pusher member moving through a bucket on the bucket conveyor;

Figure 8 is a section taken along the line 8—8 of Figure 5 showing the chute where premiums are dropped into the cartons moving on a conveyor;

Figure 9 is an elevation, partly in section, of the sensing device used to prevent filling a carton with product when no premium has been inserted; and

Figure 10 is an end view, partly in section, of the sensing device shown in Figure 9.

The invention will be understood by referring to the attached drawings which show the construction of one embodiment of the premium feeder. Referring to Figures 1 and 2, the premium feeder has a hoist 11 with forks 12 adapted to engage the bottom of a portable truck 13 used to transport supply boxes of premiums 14 from the storage area to the premium feeder. The hoist 11 is used to elevate the boxes of premiums 14 from the floor level to the level of the belt conveyor 15. For convenience, an operator's platform 16 is provided and may be used by an operator moving the premium supply boxes 14 from the truck 13 to the belt conveyor 15. The boxes of premiums 14 are opened on the side facing the hoist to expose the premiums 17. The belt conveyor 15 transfers successive boxes of premiums as indicated at 14a, 14b, 14c and 14d.

The belt conveyor 15 is of conventional construction as shown in some detail in Figure 3. The belt conveyor 15 consists of an endless belt 18 having its upper flight supported by the belt support 19 and running over the idler 20 and the tension adjusting pulley 21. The belt conveyor is driven by the motor 22 and belt drive 23 and terminates at a dead plate 24 where the empty premium boxes are collected and may be removed.

For the convenience of one or more operators, an elevated platform 25 is provided which may be mounted by any one of the stairways 26 and is protected by the guardrail 27. The operators normally stand in the area designated as the loading station 28 and remove the premiums 17 from the boxes 14c and 14d and place them in individual buckets on the bucket conveyor 29.

The bucket conveyor 29 is provided to carry the pre-

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miums away from the loading station 28. As shown in Figure 4, the bucket conveyor comprises a pair of endless chains 31 (only one chain 31 shown) having a plurality of buckets 32 attached thereto by means of the links 33. The chains 31 are guided over the idler sprockets 34 (only one idler sprocket 34 shown) and the entire bucket conveyor is driven by the chain drive 35 (Fig. 2) in timed relationship with the filling machine.

The transfer conveyor 36, shown in Figures 5, 6 and 7, is driven in timed relationship with the bucket conveyor 29 and the filling machine through a right-angle bevel gear drive 37 (Figs. 2 and 5). The transfer conveyor comprises upper and lower chain guides 38 and 39 substantially horizontal and parallel to one another with endless chains 41 and 42 movable about the convex edges of the guides 38 and 39. The chain 41 is driven by the sprocket 43 through the right-angle drive 37 and passes over the idler sprocket 44. A similar sprocket arrangement is provided for the lower chain 42. A plurality of spaced supports 45 are attached to the chains 41 and 42 by means of the connectors 46 and 47. The supports 45 are each provided with a clamp 48 suitable for engaging and clamping a rod 49 which has a pusher 51 attached to its lower end. A retainer 52 (Fig. 7) may be attached to the front face of the pusher 51 when premiums having a tendency to rotate are moved. The pushers 51 are spaced so that successive pushers 51 pass through adjoining buckets 32 where the bucket conveyor 29 intersects the transfer conveyor 36 to move each premium 17 from its bucket 32 into a trough 53 (Fig. 5). It is to be noted that the traverse of the pusher members 51 is aslant to the axis of the bucket conveyor 29, the speed being so correlated that each pusher 51 will travel forwardly with a bucket 32 while it traverses the length of the bucket. This arrangement permits the premiums to be swept from the buckets without any interference between the pushers 51 and the buckets 32.

A plurality of spring biased fingers 54, 55 and 56 are provided at the entrance to the trough 53 in order to properly align premiums having unusual configurations so that they are properly introduced into the trough 53 without jamming. The linear speed of the pusher members 51 is approximately equal to that of the open cartons 57 moving on the filling machine conveyor. The pushers 51 control the movement of premiums down the trough 53 and into a chute 58 substantially to the point where they drop by gravity into successive cartons. As shown in Figures 5 and 8, the cartons 57d, 57e, 57f and 57g are moved along by the U-shaped spacers 59 attached to the belt 60 and are supported by a conveyor belt 61 on the filling machine. The guide rails 62 keep the moving cartons in proper alignment.

It will be evident that the structure heretofore described permits the belt conveyor 15, bucket conveyor 29 and transfer conveyor 36 to be elevated over a conventional product filling line consisting of a carton magazine, carton forming means, product filling means and carton sealing means with the use of relatively little additional floor space. The only added floor space required being at the loading station 28 and this area is sufficiently narrow to permit installation between adjoining filling lines. A carton magazine 63 and a carton erector 64 as well as the carton conveyor 59 of a conventional filling machine are shown extending from beneath the premium feeder in Figure 1.

Referring again to Figure 8, there is shown a paddle detector 65, mounted in the discharge chute 58 and pivoted at 66. The paddle detector is normally held in the position indicated by the spring 67 and the stop and adjusting screw 68. As each premium is discharged through the chute 58, it moves the paddle detector 65 to actuate a button 69 on the switch 70. The switch 70 is normally closed and when actuated by the paddle detector 65 it prevents a momentary electric signal from actuating the sensing device (to be hereinafter described).

The sensing device is shown in Figures 9 and 10 and

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its purpose is to prevent filling with product a carton in which no premium has been inserted. The sensing device consists of the front and back plates 71 and 72 spaced and supported by means of the rods 73. The sensing device is driven in synchronism with the filling machine by means of a sprocket 74 which drives a rotating member 75 through the pinion 76 and gear 77. The rotating member 75 is provided with a plurality of pins 78 held for sliding axial movement by the bushings 79 and 80 in the member 75 and gear 77. Each pin 78 has a stop 81 near its end. A solenoid 82 having a pushing member 83 aligned with the end of each successive pin 78 during a portion of its rotative cycle is mounted on the plate 72. The U-shaped springs 84 on the member 75 (Fig. 9) bear against adjoining pins 78 to prevent inadvertent axial movement thereof. An arm 85 pivoted at 86 is adapted to actuate a switch 87 attached to the bracket 88 on the plate 71. The face 89 of the arm 85 is slightly displaced with respect to the ends 90 of the pins 78 so that during normal operation and when the pins 78 are not displaced they will not actuate the arm 85. However, if the solenoid 82 is actuated, it moves the member 83 to the left (as viewed in Figure 10) displacing one of the pins 78 axially, to actuate the switch 87 after that particular pin has rotated to the point where it moves the arm 85.

The sensing device is operated so that an electric signal from a conventional cam switch is momentarily fed to the solenoid 82 through the switch 70 in timed relationship with each premium passing the detector 65. If a premium deflects the paddle detector 65, it opens the switch 70, thereby preventing the signal from reaching the solenoid 82 and preventing momentary energization. Spring 91 normally holds member 83 in non-operative position. Therefore, the pin 78 under the member 83 at the time the electric signal is fed to the switch 70 is not displaced and does not actuate the switch 87 when it later rotates past the arm 85. However, in the event that no premium passes the detector 65 the switch 70 is not opened and the solenoid 82 is energized thereby operating to deflect the pin 78 which is aligned with the member 83 at that time. The deflected pin actuates the switch 87 by moving the arm 85 after it has rotated to that position, and is then restored to its normal position by a cam 92.

During the time the deflected pin 78 rotates to actuate the switch 87, the carton with no premium is being moved on the conveyor 61 to the filling head of the filling machine. However, actuation of the switch 87 by the deflected pin 78 sends a signal to a conventional no-carton detection device at the filling head so that the carton having no premium is not filled with product. This empty carton is then removed automatically from the filling line beyond the filling head by means of a conventional outage detection device.

While particular embodiments of the invention have been illustrated and described it will be obvious to those skilled in the art that various changes and modifications may be made without departing from the invention and that it is intended to cover in the appended claims all such changes and modifications that come within the true spirit and scope of the invention.

What is claimed is:

1. A premium feeder for inserting a premium into each successive carton traveling on a filling machine comprising a moving bucket conveyor having a plurality of closely spaced side-by-side buckets, each bucket adapted to contain a premium, a transfer conveyor including a trough located substantially at the end of said bucket conveyor, the terminus of said trough overlying the open ends of said traveling cartons, said transfer conveyor having a plurality of pusher members mounted thereon and adapted to move through said trough, said transfer conveyor moving at a substantially greater speed than said bucket conveyor, said pusher members adapted to sweep

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through successive buckets thereby removing premiums from the buckets into the trough wherein the premiums are moved by said pusher members in single file order to the end of the trough whence said premiums fall by gravity into successive traveling cartons.

2. Apparatus for feeding premiums into the open ends of traveling cartons comprising a moving bucket conveyor having a plurality of closely spaced side-by-side buckets each capable of bearing a premium to be fed to said cartons, said bucket conveyor moving at a speed which is substantially less than that of said traveling cartons, a transfer conveyor substantially at the end of said bucket conveyor, said transfer conveyor provided with a plurality of pusher members each adapted to sweep through successive buckets on said bucket conveyor to thereby sweep successive premiums into a trough in single file order, said trough extending from the bucket conveyor to a point above the traveling cartons, said pusher members being actuated by said transfer conveyor to move the premiums through the entire length of the trough so that the premiums are moving at substantially the same speed and in the same direction as said traveling cartons when said premiums reach the end of the trough whereby successive premiums drop into successive cartons.

3. A premium feeder for inserting premiums in cartons traveling on a filling machine, having in combination a bucket conveyor adapted to receive and convey premiums in closely spaced side-by-side relationship, said bucket conveyor moving at a speed which is substantially less than that of said cartons, a transfer conveyor intersecting said bucket conveyor and adapted to remove the premiums from said bucket conveyor, said transfer conveyor including means for pushing premiums to a discharge station above said cartons at which point said premiums are moving at substantially the same speed and in the same direction as said cartons and a trough through which premiums are pushed in single file order to said discharge station.

4. A premium feeder as claimed in claim 3 wherein said transfer conveyor comprises a plurality of spaced pusher members mounted for movement in an ambagious path so that successive pusher members move through successive buckets.

5. A premium feeder for inserting a premium into each successive carton traveling on a filling machine comprising a moving bucket conveyor having a plurality of side-by-side buckets, each bucket adapted to contain a premium, a transfer conveyor including a trough located substantially at the end of said bucket conveyor, the

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terminus of said trough overlying the open ends of said traveling cartons, said transfer conveyor having a plurality of pusher members mounted thereon and adapted to move through said trough, said pusher members adapted to sweep through successive buckets thereby removing premiums from the buckets into the trough wherein the premiums are moved by said pusher members in single file order to the end of the trough whence said premiums fall by gravity into successive traveling cartons, and a sensing system comprising means for feeding electric signals to a sensing device in timed relationship with said premiums passing through a discharge station at the end of said trough, a detector at said discharge station adapted to prevent said signal from reaching said device upon being actuated by a premium, said sensing device comprising means for driving a rotating member in synchronism with said filling machine, said rotating member being provided with a multiplicity of axially slidable pins, a solenoid with its pusher member adapted upon receiving said signal to slide a particular pin to a location wherein said pin actuates means to prevent the filling of a particular carton having no premium, and means to return said pin to its original location.

6. A premium feeder for inserting premiums in cartons on a filling machine, having in combination a bucket conveyor adapted to receive and convey premiums in side-by-side relationship, a transfer conveyor intersecting said bucket conveyor and adapted to remove the premiums from said bucket conveyor, said transfer conveyor comprising a plurality of spaced pusher members mounted for movement in an ambagious path so that successive pusher members move through successive buckets on said bucket conveyor to thereby push successive premiums through a trough in single file order to a discharge station above said cartons, and means for detecting the presence of a premium as the premium moves through said discharge station, said means preventing an electrical signal from reaching a no-carton detection device which prevents the filling of a carton with product when actuated by said electrical signal.

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