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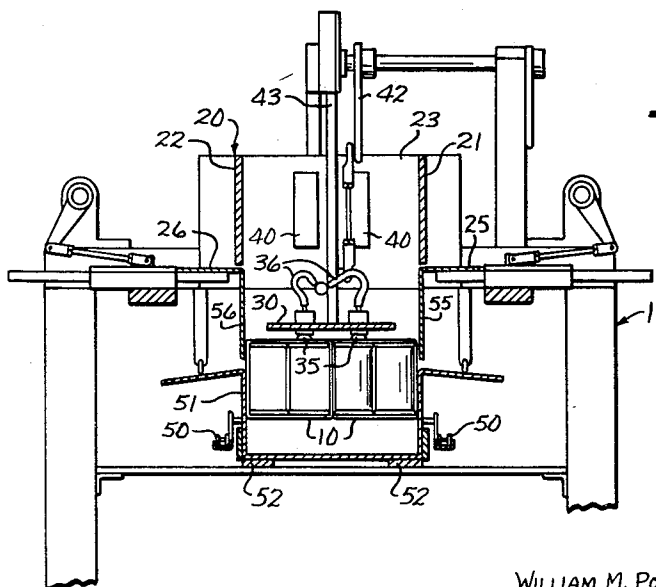
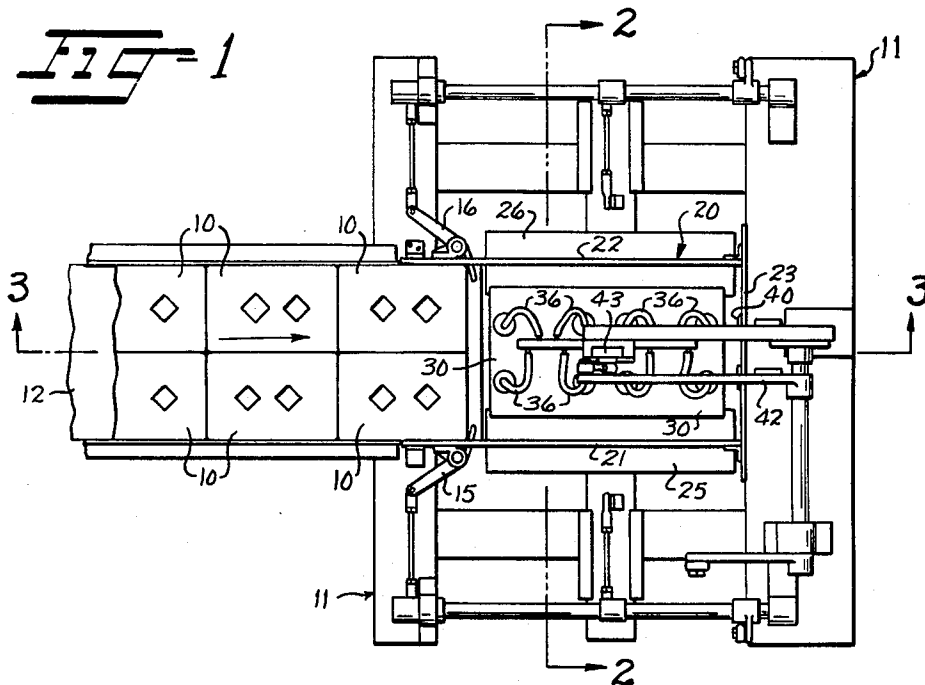
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METHOD OF PLACING CARTONS INTO PACKING CASES

Filed May 3, 1955

2 Sheets-Sheet 1



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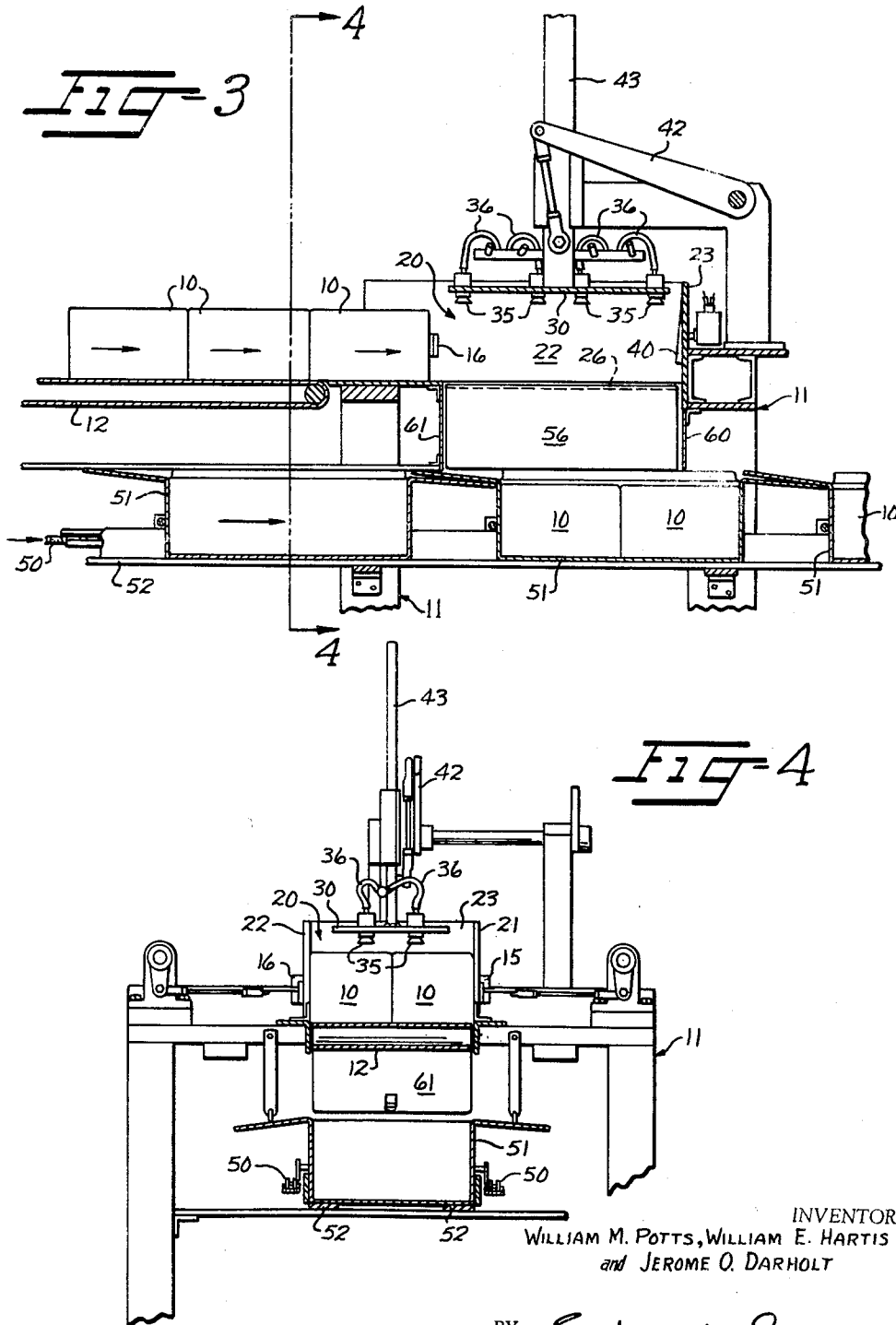
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1

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## METHOD OF PLACING CARTONS INTO PACKING CASES

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1 Claim. (Cl. 53—26)

This invention relates to the method of placing a plurality of cartons or articles into a single packing case and more especially to a method of placing cartons into packing cases wherein said cartons are under positive control at all times, that is, at no time are the cartons released to fall by gravity into said packing case.

Heretofore, cartons have been placed in packing cases by hand or manually since most machines designed to package a plurality of cartons into packing cases have been of the gravity drop type which often permits the cartons to be dropped in the packing case crooked or at angles to the bottom and top of said packing case. If the cartons are not properly placed in the packing case the top of the case cannot be closed and the packaging machine and the cartons packed in said packing case will be damaged.

It is, therefore, the primary object of this invention to provide a method of automatically packing cartons into a packing case embodying simple methods for positively controlling the movement and position of the cartons as they are placed into the packing cases.

It is another object of this invention to provide a novel method of placing a plurality of cartons into a packing case which comprises the steps of directing a continuous stream of cartons at a given elevation, directing a continuous stream of packing cases moved in a step-by-step manner at another lower elevation, stopping the leading cartons of the continuous stream of cartons, releasing the leading cartons of said stream of cartons, allowing a predetermined number of said cartons to advance beyond said stopping point into a carton receiving chamber, supporting said cartons from below in said carton receiving chamber above one of said packing cases engaging said predetermined number of cartons from above, removing the support from below said cartons, and lowering said cartons into said packing case.

It is a further object of this invention to provide a novel method of lowering a predetermined number of cartons into a packing case wherein the cartons are positively controlled while being lowered into the packing case. This method of positively controlling the cartons thus completely eliminates the hazards of crooked cartons which are so frequent in the gravity drop type packaging machine used heretofore.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a machine such as may be used to carry out the various steps of this method of placing a plurality of cartons into a packing case;

Figure 2 is a transverse vertical sectional view taken substantially along the line 2—2 in Figure 1 and showing some of the parts in a different position;

Figure 3 is a longitudinal vertical sectional view taken substantially along the line 3—3 in Figure 1;

Figure 4 is a transverse vertical sectional view taken substantially along the line 4—4 in Figure 3 but showing

2

the packing case and the cartons in different positions from that shown in Figure 3.

This method of packaging cartons into cases comprises the steps of: bringing into a packaging machine broadly indicated by numeral 11 a plurality of cartons 10 in side-by-side relationship on a continuously moving conveyor belt 12 and into engagement with a pair of movable carton retaining members 15 and 16 at opposite sides of a carton receiving chamber or zone broadly indicated at 20. The carton receiving chamber 20 comprises spaced side walls 21 and 22, an end wall 23 and removable bottom carton support members 25 and 26 adjacent opposite side walls 21 and 22 of the carton receiving chamber 20.

A carton supporting and lowering plate 30 is provided in the chamber 20 for engaging the upper surfaces of the cartons 10 moved into the chamber 20 and for lowering the same from the chamber 20 into packing cases. The supporting means for the cartons 10 on the plate 30 in the drawings is shown as a plurality of suction cups 35 having vacuum lines 36 attached thereto and leading to a suitable suction pump or air withdrawing device, not shown, which creates a vacuum in the cups 35 as they engage the upper surfaces of the cartons 10. Although suction cups 35 are shown on the plate 30 in the drawings, it is to be understood that, other means could be employed to support the cartons 10 from above by the plate 30 such as electromagnets or the like. While the suction cups 35 will support any type of carton having a smooth upper surface, electromagnets will support cartons which carry any metal objects or containers therein.

A pair of indicators 40 are provided in the end wall 23 of the chamber 20 to indicate when the lead carton 10 is seated against the end plate 23 and said indicators actuate an electric clutch, not shown, to start movement of the plate 30 by means of a crank arm 42 and a guide 43.

A lower conveyor chain 50 is provided to move a plurality of packing cases 51 along guide rails 52 in an intermittent manner so that the packing cases 51 will stop directly beneath the carton receiving chamber 20 and remain in this position until the cartons 10 have been placed therein by the plate 30.

The removable supports 25 and 26 adjacent opposite sides of the carton receiving chamber 20 are provided with downwardly extending guide portions 55 and 56. Front and rear guide walls 60 and 61 extend downwardly from the chamber 20 to adjacent the upper open end of the packing cases 51. The walls 55, 56, 60 and 61 are provided to guide the cartons 10 as they are moved downwardly by the plate 30.

In operation, the cartons 10 may be placed upon the conveyor belt 12 manually or they may be fed thereto directly from a carton packing machine which places the articles in the cartons. The leading two of the cartons 10 on the conveyor 12 will engage the movable carton retaining members 15 and 16 to stop their forward motion and the remaining cartons will exert pressure against the leading cartons. Since the conveyor belt 12 continues to move, it will merely slide along the bottom of the cartons 10. As the packing machine 11 starts its cycle of operation, the movable carton retaining members 15 and 16 are moved to inoperative position to allow the row of cartons 10 to be moved forwardly. At this time the removable supports 25 and 26 will occupy substantially the position shown in Figure 1 so that the leading four cartons are slid into the chamber 20 and onto and supported by the removable support members 25 and 26. Upon the leading two of the cartons 10 reaching the end plate 23 the indicators 40 will be contacted to thus start the second cycle of the packing machine 11.

The second cycle of the packing machine includes the steps of lowering the plate 30 along with the suction cups

35 downwardly into engagement with the top portions of the leading four cartons in the carton receiving chamber-20 with suction being applied to the lines 36 so that the suction cups 35 will grip the upper surfaces of the cartons 10. The removable support plates 25 and 26 are then moved outwardly relative to each other from beneath the cartons 10 to substantially the position shown in Figure 2 and the movable carton retaining members 15 and 16 are again moved to the position shown in Figure 1 to thus move the leading two of the cartons 10 which are not disposed in the carton receiving chamber 20 slightly rearwardly to the position shown in Figure 1. At this time, one of the packing cases 51 will be in position directly beneath the carton receiving chamber 20 and the plate 30 will be lowered by the crank arm 42 and the guide 43 to thus lower the four cartons in the carton receiving chamber 20 into the packing case 51 (Figure 2).

Upon the cartons 10 being placed in the packing case 51 the suction in the lines 36 will be broken to thus release the suction cups 35 from the upper surface of the cartons 10 and the arm 42 will again move the guide 43 and the plate 30 upwardly to substantially the position shown in Figure 3. As the plate 30 and the suction cups 35 are moving upwardly the conveyor chain 50 moves the filled packing case from beneath the carton receiving chamber 20 or from left to right in Figure 3 and places the next succeeding empty packing case 51 in position beneath the carton receiving chamber 20 preparatory to filling the same with cartons.

Although the method described teaches placing four cartons into a packing case, it is to be understood that, the packing case 51 could be deeper and the operation of the carton supporting and lowering plate 30 could be repeated as many times as is desired to lower eight cartons, for instance, into the packing case 51 before the conveyor chain 50 moves to place another empty packing case beneath the carton receiving chamber 20.

It is thus seen that I have provided a method of packing a plurality of cartons into a packing case wherein the cartons are at all times engaged by one or more elements of the packing machine and at no time during

this method of packing cartons into a packing case are the cartons released to fall by gravity or released so that they may turn relative to each other. This positive control at all times insures that the cartons 10 will be placed in the packing case 51 in a straight position without damage to the cartons or the articles packed in the cartons.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claim.

#### We claim:

15 A method of packaging a plurality of substantially rectangular articles in a packing case comprising the steps of feeding a pair of side-by-side rows of articles in parallel straight paths of travel, stopping the leading ends of the two rows of articles, separately supporting a predetermined number of the leading articles in each row from beneath, suspendingly supporting the predetermined number of leading articles from above, feeding a row of packing cases in a step-by-step manner beneath and parallel to the side-by-side rows of articles, the feeding 25 of the row of packing cases being timed with the feeding of the side-by-side rows of articles so that the leading packing case is positioned beneath the leading articles in each row, simultaneously releasing the support from beneath the separately supported articles in each row, 30 and lowering the suspendingly supported articles into an open packing case positioned therebeneath.

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