

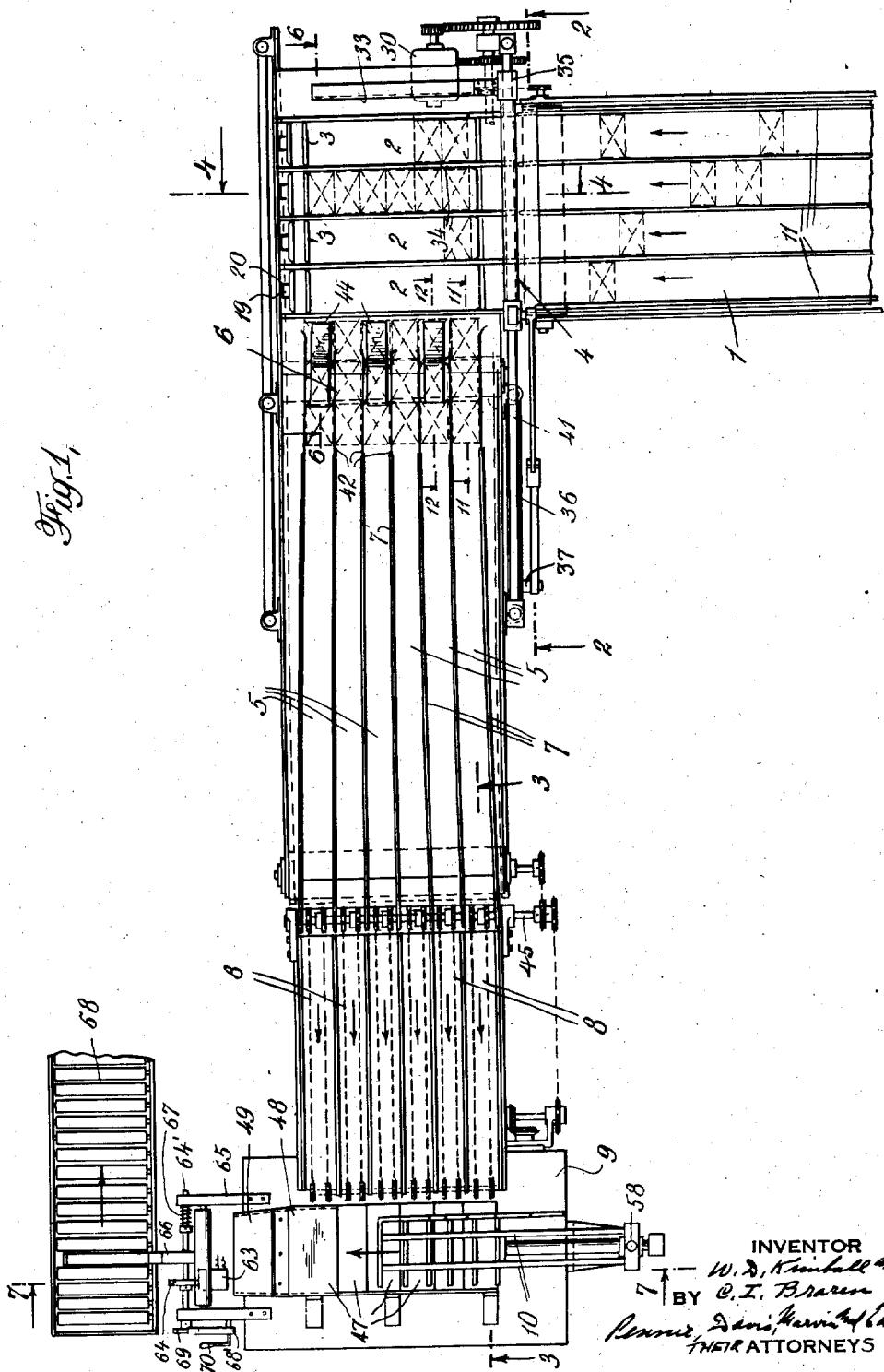
Feb. 22, 1938.

W. D. KIMBALL ET AL

2,109,294

CASE PACKING MACHINE

Original Filed Feb. 7, 1934 5 Sheets-Sheet 1



**Feb. 22, 1938.**

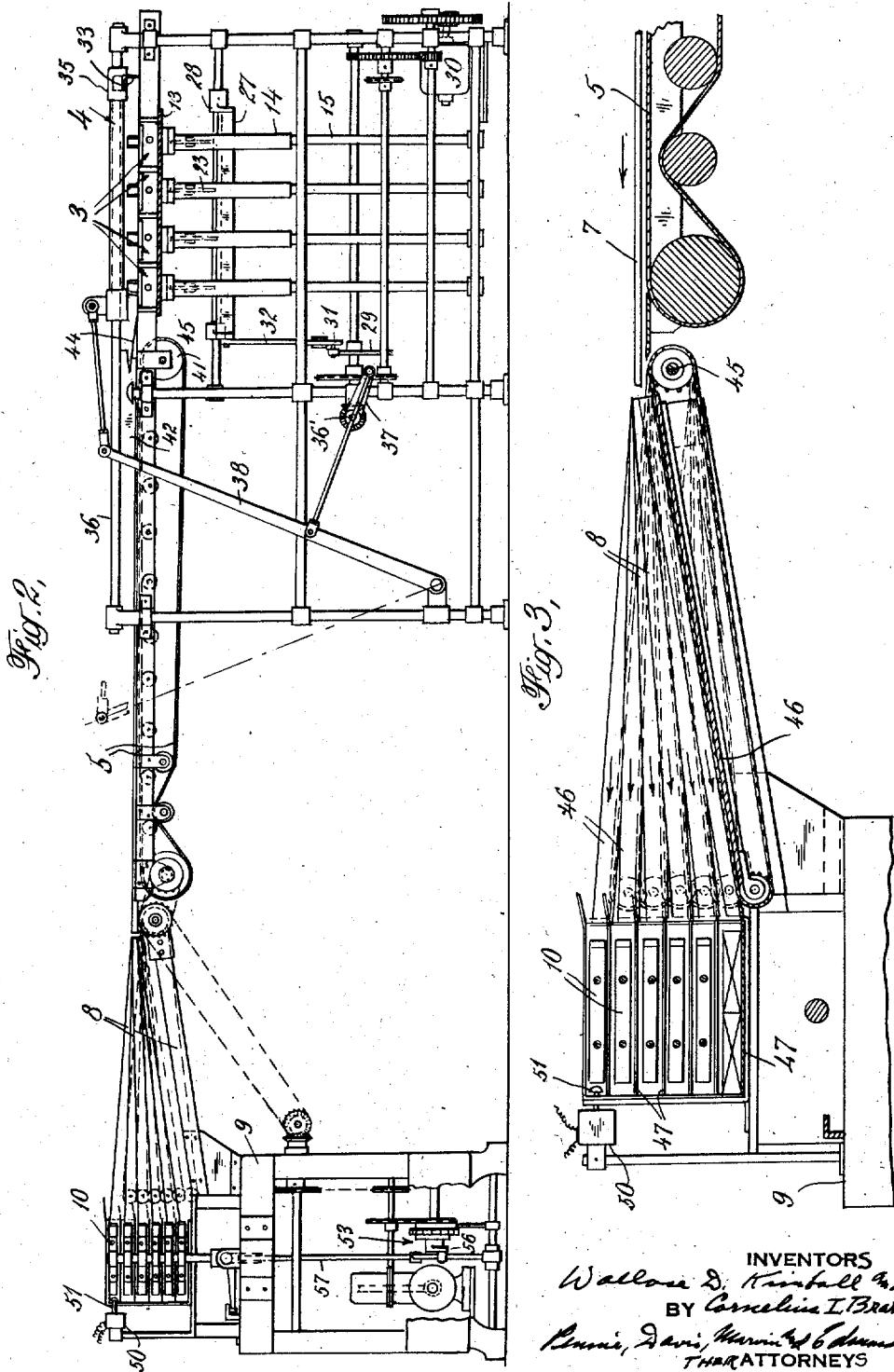
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2,109,294

## CASE PACKING MACHINE

Original Filed Feb. 7, 1934

5 Sheets-Sheet 2



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CASE PACKING MACHINE

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Fig. 5,

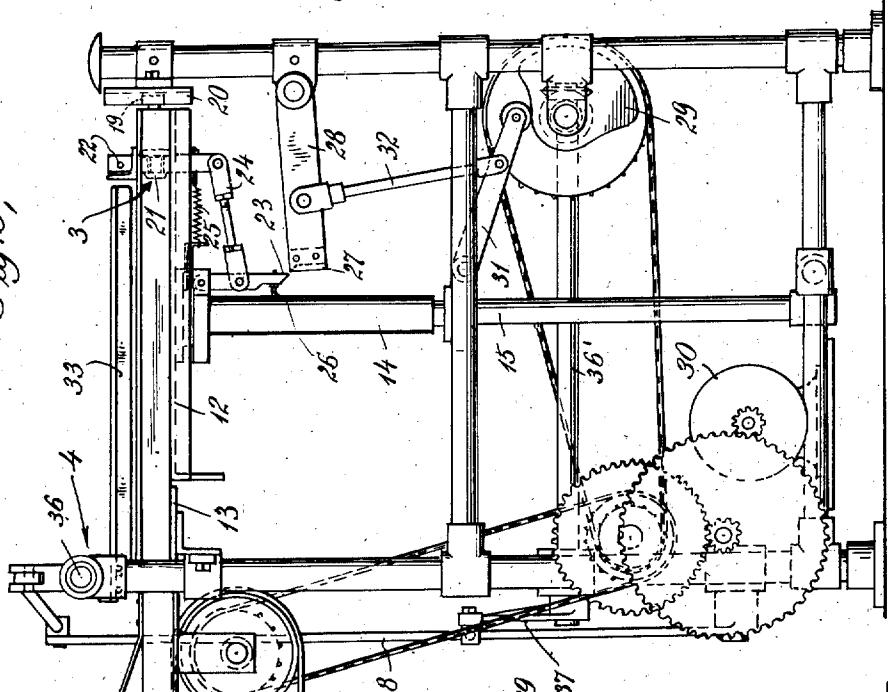
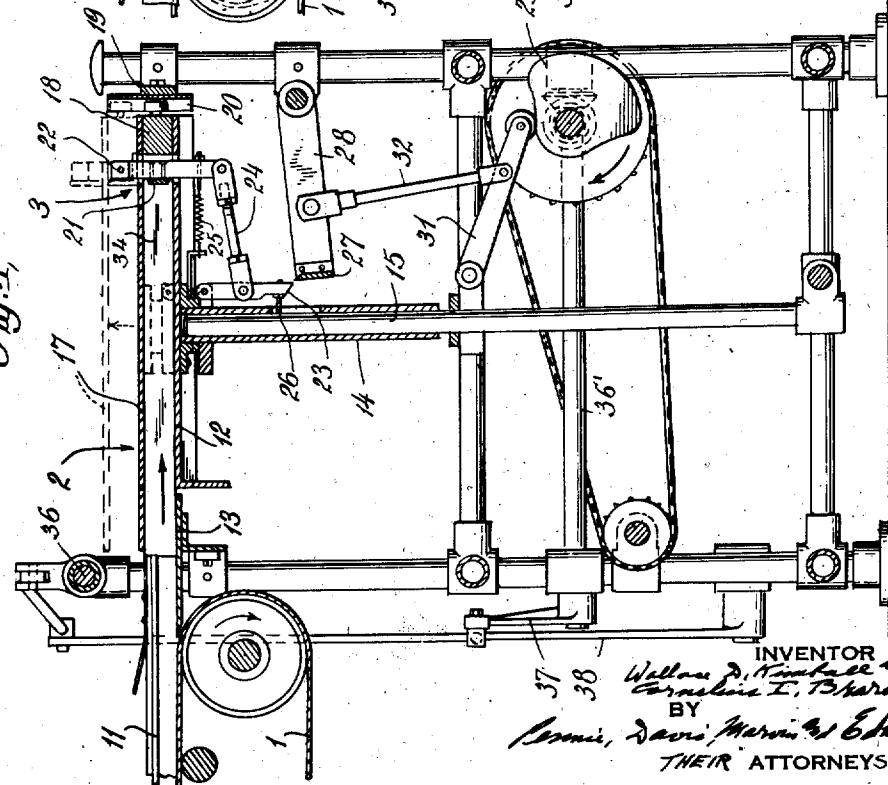


Fig. 4,



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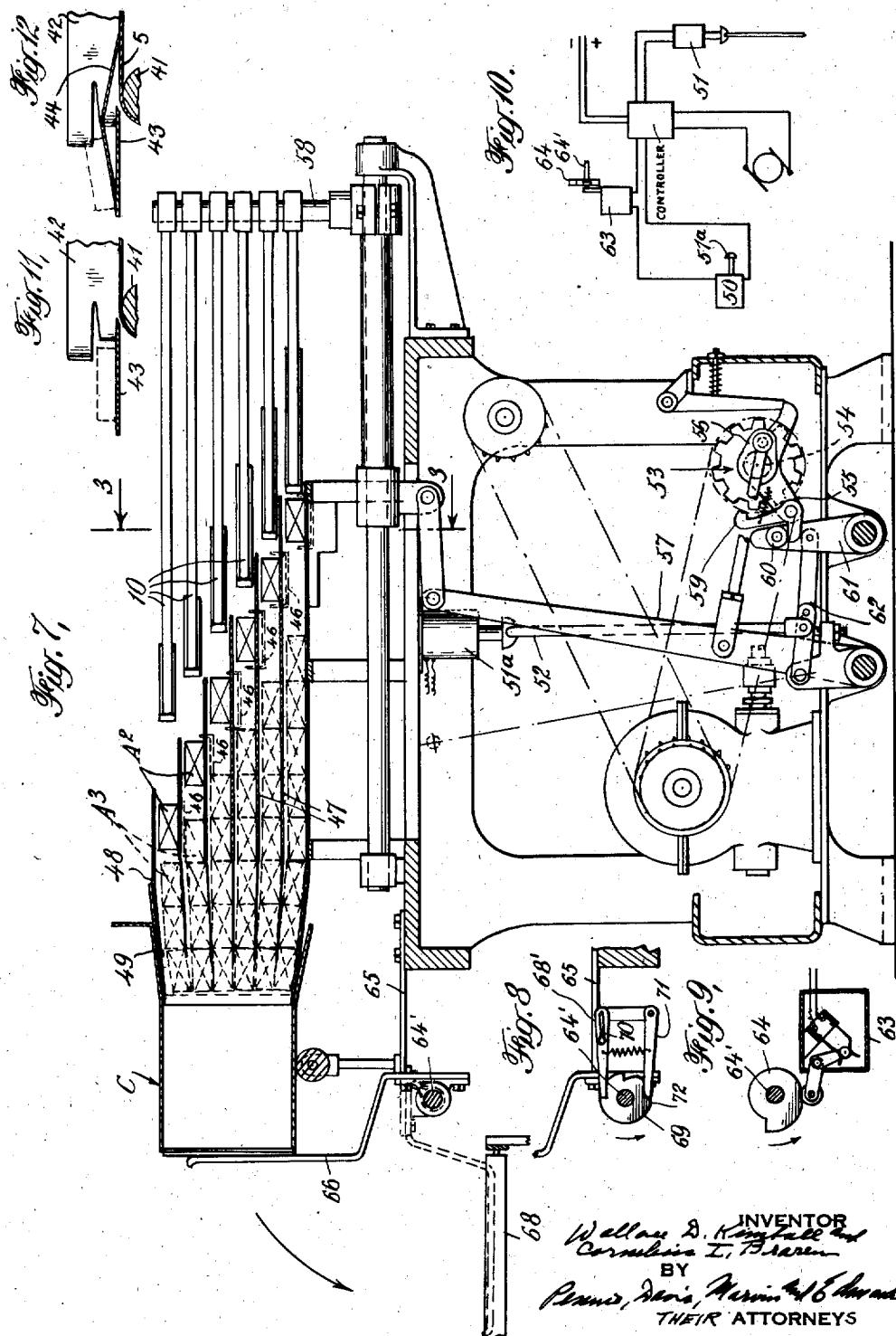
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## CASE PACKING MACHINE

Original Filed Feb. 7, 1934 5 Sheets-Sheet 5



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# UNITED STATES PATENT OFFICE

2,109,294

## CASE PACKING MACHINE

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Application February 7, 1934, Serial No. 710,084  
Renewed January 5, 1937

19 Claims. (Cl. 226—14)

This invention relates to machines for packing articles in cartons or other containers. It has been the trend in recent years to pack articles of merchandise in small containers which are frequently wrapped in ornamental wrappers or printed with advertising matter or otherwise finished in a manner such that too much handling, particularly rubbing one package on the other, tends to deface the outer surface of the wrappers and render the packages less salable. For this reason there are still many articles of merchandise which are packed in their shipping containers by hand, notwithstanding the now well recognized fact that packing machines can be operated at far less expense than involved in the employment of hand labor.

The particular object of the present invention is to provide a machine for packing articles in shipping containers which is particularly designed to avoid as far as possible the rubbing or other handling of the articles in a way to deface the most delicate outer wrapping or label which is now in use.

In packing machines as herein placed on the market it has been customary to pack the articles in the carton layer by layer. In such operation the succeeding layers are pushed into the carton over the underlying layers, which is, for the reasons stated above, particularly disadvantageous in the handling of articles in fancy wrappers. In some machines the charge of articles is first assembled on some form of support and the charge as a whole inserted in the carton, but in the commercial machines of this type there is also the rubbing of the articles one on the other in assembling the several layers.

In the machine of the present application the articles are superimposed by a novel arrangement of feed belts which maintains the several rows of articles out of contact with each other in bringing the rows of articles to different elevations to be ultimately arranged in multiple layers in the carton. This arrangement not only has the advantage of avoiding damage to the article, but permits the machine to be operated continuously at a more rapid rate than the machines of the prior art wherein the heavily laden support for the carton or for the assembled charge of articles had to be moved one step up or down between each of the successive operations of the packing plunger.

A further object of the invention is to provide a simple and entirely automatic package feeding and arranging mechanism for controlling the feed of articles to the machine whereby the ma-

chine is designed to receive articles from a number of different chutes, conveyors or other "lines" leading from the labeling and wrapping machine which performed the last operation in the actual manufacture of the articles to be packaged and to deliver such articles, in completely filled rows of any desired number, to the conveyors for assembling the articles for the packing plungers.

A further object of the invention is to provide a machine which is adapted to package articles of all descriptions including fragile articles such as above described, which is entirely automatic in operation, is of very simple construction, and which because the intermittently operated parts are few in number and of light weight, can be rapidly operated.

Further objects of the invention will appear from the following description taken in conjunction with the accompanying drawings, wherein we have illustrated a preferred form of our invention which has been found to possess the advantages above enumerated.

Referring to the drawings,

Fig. 1 is a plan view of our improved machine;  
Fig. 2 is a side elevation looking from the right of Fig. 1, partly in section in the line 2—2;

Fig. 3 is an enlarged vertical section on line 3—3 of Figs. 1 and 7;

Fig. 4 is an enlarged vertical sectional view on line 4—4 of Fig. 1 showing particularly the article-control feed mechanism for insuring a full charge of articles;

Fig. 5 is an end view of the portion of the machine shown in Fig. 4;

Fig. 6 is an longitudinal sectional view at right angles to Fig. 4 on line 6—6 of Fig. 1;

Fig. 7 is an enlarged vertical section on line 1—1 of Fig. 1;

Figs. 8 and 9 are detail views showing certain features of the control mechanism which will be later described;

Fig. 10 is a diagrammatic view of the electric control circuit governing the operation of the charging plungers; and

Figs. 11 and 12 are detail views showing the operation of the guides for separating the articles into rows.

Before describing our improved machine in detail we will describe with reference to Figs. 1 and 2 the general construction of the machine and its mode of operation. In the machine selected for illustration the articles to be packaged enter in four lines along a feed belt marked 1 in Fig. 1. The feed belt operates continuously but the articles are not positioned on the feed belt in im-

mediate contact or in any uniform relation. This is due to the fact that in manufacturing establishments generally it is the practice to inspect the articles when delivered from the wrapping and labeling machines and remove from the conveyors all articles which do not come up to standard. This examination has the effect of placing gaps in the line of articles being fed to the packaging machine, which gaps vary in extent and frequency. Also of course some one or other of the wrapping machines will be temporarily shut down for repairs or other reason, thus producing a long gap or a complete discontinuance of articles in one row or another of the four rows on the feed belt.

In advance of the feed belts and in position to receive the articles fed thereby are a series of article-supports, one for each belt, marked 2 in the drawings. These article supports are in line with the several lines of articles on the feed belt so that the continued movement of the feed belt will eventually deliver sufficient articles to each support to form a continuous row of articles in contact with each other. When sufficient articles have been accumulated on any one of the several supports for the row to be filled as indicated, the continued movement of the feed belt causes the articles to exert sufficient pressure on the control trip 3, for that particular support, which trip, by mechanism to be later described causes that particular article support to be shifted into position for the articles thereon to be advanced into the machine. In the machine shown the article-supports 2 are raised by the mechanism controlled through the trip 3, into position to be engaged by a pusher mechanism 4 which shifts the row of articles transversely of the direction of feed of the belts 1 onto a feed belt 5 extending in a direction at right angles to the belts 1. By means of the belt 5 the articles are advanced as a complete row, extending transversely of belt 5, to the mechanism by which they are arranged in proper formation to make a charge for the packing container.

Overlying the belt 5 as shown particularly in Fig. 1 are a series of guides 6 which separate the articles of each compact row delivered from the support 2 slightly from each other, so that they may be carried by the belt 5 in separate pathways between guide rods 7 overlying the belt but still in a complete transverse row as indicated in Fig. 1. The belt 5 is operated continuously and serves to feed the articles continuously to a series of separate pairs of chain conveyors 8, one for each pathway defined by the guide rods 7, which chains are mounted at different angles to the horizontal as indicated in Fig. 2, to thereby not only advance the articles toward the assembly table 9 but also to bring the articles to different elevations. There are as many pathways and pairs of chains 8 as there are separate layers of articles to be packed in the carton, the term "layer" being used in the specification as indicating the rows of articles lying in the same horizontal plane when the carton is supported in the position in which it is packed.

The chains 8, like the belt 5, move continuously and each time a row of articles is shifted from the supports 2 onto the belt 5, that row of articles will be ultimately delivered by the chains 8 into position in front of the packing plungers 10. There is one packing plunger for each layer of articles, the packing plungers being operated as a unit to shift the articles delivered by the chains 8 transversely of the direction of movement of

the belts and in a direction to be ultimately guided into the carton.

The operation of the packing plungers is also controlled by the movement of the articles themselves, in this instance by the pressure of the articles under the influence of the chains 8. By this arrangement the packing plungers are operated only when the article supports in front of the plunger are full, thus insuring the deposit of a complete tier of articles into the carton at each operation of the plunger. When the final tier of articles has been deposited in the carton the carton is ejected from the machine and the machine stops until a fresh carton is supplied.

The mechanism for carrying out the operation as above described is shown in enlarged detail in Figs. 3, 4, 5, 6, and 7, to which reference will now be particularly made.

The feed belt 1 is continuously driven and the articles advanced thereby are maintained in alignment by overlying guides 11 providing in the present instance four rows of articles moving continuously into the machine, which rows, however, may contain gaps of greater or less extent. Each article path is defined by the overlying guides 11 and leads into a separate article-support 2 the construction of which is shown in detail in Figs. 4 and 5. Each support comprises a platform 12 whose upper surface lies in the same plane as the feed belt. The platform 12 is of a width approximating the space between the guides 11 and lies in direct line with the pathway defined by the guides so that the articles advanced by the belt will be fed directly onto the platform 12 over an intermediate fixed bridge 13.

The platform 12 is mounted on the top of a tubular column 14 which is mounted for vertical adjustment on a fixed vertical shaft 15, the column and shaft constituting the sole support of the platform 12. Overlying the platform 12 and spaced therefrom by a distance slightly greater than the thickness of the article to be packed, is a cover plate 17. This cover plate is supported at its end away from the belt 1 by means of a block 18 fixed between the platform and cover plate. Also fixed to the block 18 is a guide roller 19 working in a vertical channel guide 20 fixed to the machine frame, the roller serving to guide the article-support in its up-and-down movement and maintain it in proper position to receive the articles from the feed belt.

A movable stop member 21 of trip 3 is mounted on the article-support adjacent the block 18 and in position to be engaged by the articles advanced by the belt 1 when sufficient articles have been delivered thereto to make a complete row. This stop member 21 is suspended from a suitable pivot 22 supported on the upper face of the cover plate 17. The member 21 extends through slots in the plate 17 and platform 12 and is spaced sufficiently from the block 18 to permit a slight rocking movement on its pivot under the pressure of the articles delivered to the platform by the belt 1.

Suspended from the under side of the platform 12 adjacent the sleeve 14 is a trip lever 23, which lever is connected to the member 21 by an adjustable link 24. A spring 25 is provided for holding the member 21 away from the block 18 to an extent permitted by a stop pin 26 carried by the fixed column 15 and cooperating with a stop projection on the trip arm 23. Cooperating with the trip arm 23 is an actuating bar 27, which bar extends across the machine underneath the four separate article-supports 2 whereby the single

operating bar 27 will engage and operate any or all of the trip arms 28 projected into its path of movement by the pressure of the articles against the members 21. The actuating bar 27 is supported for vertical oscillation upon rock arms 28 mounted on fixed pivots carried by the frame members of the machine and is periodically elevated by means of a cam 29 continuously rotated from the driving motor 30 of the machine, 5 the cam operating through a cam arm 31 and link 32 connected to one of the rock arms 28 supporting the actuating bar.

The position of the trip arm 28 is so adjusted by means of the arm 24 and the adjustable stop carried by the trip arm as to just be clear of the operating bar 27 when elevated by the cam when the arm 28 is held in its position of rest against the stop 26. Until the member 21 is shifted by the pressure of the articles advanced by the feed belt the article-support 2 will remain stationary and the actuating arm 27 will oscillate idly up and down. When the trip member 21 is shifted as described, the arm 28 will be brought into position over the actuating bar 27 and on the upward movement of the actuating bar the support 2 will be elevated a sufficient distance to bring the articles supported on the platform 12 above the plane of the articles on the feed belts as shown in dotted lines in Figs. 4 and 6 and into position to be engaged by the reciprocating arm 33 of pusher mechanism 4 (see Fig. 6) which reciprocates across the four article-supports 2 and thereby serves to deliver the row of articles which has been elevated, from its support onto the feed belt 5. It may be that two or more supports will be elevated at the same movement of the actuating bar 27. In such case the reciprocating arm 33 will shift all the rows so elevated onto the feed belt.

40 The several article-supports are separated from each other by means of fixed guide bars 34 which constitute in effect extensions of the guides 11. These guides 34 are fixed to the bridge 13 and extend between the several cover plates 17 as shown more particularly in Fig. 6, the top edges of the guide bars being flush with the upper surface of the cover plates to thereby form a continuous surface over which the articles are shifted by the arm 33. When the supports 2 are elevated by the actuating bar 27 as described, the platforms 12 on which the articles rest are brought into line with the cover plates 17 of the supports which are not elevated, whereby there will always be a substantially continuous surface over which the articles are advanced by the reciprocating arm 33.

45 The arm 33 consists of an angle member supported at one end upon a sleeve 35 mounted for reciprocation on a fixed guide rod 36 which in turn is fixedly attached to the frame members in a position overlying the bridge 13. The arm 33 is operated in timed sequence with the actuating bar 27 by means of a crank shaft 36' driven from the shaft of the cam 29 through suitable bevel gears, as shown, whereby the slide makes one complete reciprocation for each revolution of the cam shaft. The cam 29 is so shaped and so timed with respect to the crank 37 which operates the arm 33 that the supports 2 will be elevated during the time that the arm 33 is in its position at the end of its stroke away from the delivery belt 5, and will be held in elevated position throughout the movement of the arm across the four supports and just clear of the cover plate 17 nearest the belt 5. The supports are then lowered while

the arm is completing its movement of delivering the articles to the belt 5. In other words the arm 33 has a movement sufficiently in excess of the combined width of the four supports for the supports to be raised and lowered while the arm is completing or reversing its movement. The arm will return to its initial position shown in Fig. 6 while the cam roller is on the low part of the cam.

5 Thus the reciprocating arm 33 will deliver to the belt 6 on each reciprocation whatever rows of articles have been elevated by the actuating bar 27 and in the event none of the bars have been elevated, no articles will be delivered to the belt 5. The belt 5, whenever it receives articles at 10 all, thus receives articles in one or more complete rows and these rows are carried forward by the belt 6 in substantially transverse alignment but separated from each other by the overlying guide bars 7, as shown more particularly 15 in Fig. 1.

In order to space the articles from each other as they are advanced onto the belt 5 so that the guide bars 7 may pass between them, we provide a separator mounted over the pulley 41 which supports the end of the belt 5 adjacent the supports 2. This separator comprises a series of guide plates 42 attached to the ends of the guide rods 7 and projecting toward the supports 2 and overlying the stationary bridge 43 lying between the 25 adjacent support and the belt forming a continuous surface for the articles thereover. The guides 42 are bifurcated at their free ends at a point corresponding with the thickness of the article and the tongues formed by this bifurcation are bent 30 in opposite directions.

35 As will be seen from Fig. 1, the guides are arranged so that between one pair of guide rods the two lower tongues will be flared outwardly to guide the article advanced by the reciprocating 40 arm 33 into the space between the guide rods while the next two guide plates 42 will have their upper tongues bent outwardly to engage and guide the article into the space between the guide rods. As stated above, the upper tongues 45 of the guide plates 42 are at an elevation from the belt greater than the thickness of the article and consequently the articles to be acted on by the upper tongues must be elevated above the plane of the belt as they are advanced by the arm 33. To this end between each alternate pair of 50 guide rods, namely, those which have the upper tongues of the guide plates 42 flared outwardly, there is placed a bridge piece 44. These bridge-pieces extend beyond the ends of the guide plates 42 and the inclination of the bridge is such that every other article in the row advanced by the arm 33 will be elevated sufficiently to clear the lower tongues of the guide plates and be engaged by the upper tongues and thus directed into the 55 space between the adjacent guide rods. The intermediate articles, that is, those lying between the articles which ride up on the bridge pieces, will move along the surface of the bridge 43 and thus pass under the upper tongues of the guide plates and be engaged by the outwardly flaring lower tongues and thus guided into the channels between the guide rods.

60 In order that the articles may be further separated laterally from each other as they are advanced toward the stacking belts 8 the guide rods 7 diverge slightly toward the delivery end of the machine, as shown in Fig. 1, so as to allow ample room for the individual belts 8 to run clear of each other.

The delivery chains 8 are all driven by a common sprocket shaft 45 at the end adjacent the belt 5, but at their ends adjacent the assembly table 9 each pair of chains is at a different elevation from the adjacent pair by a difference at least equal to the height or thickness of the articles being packed, so that, of the single row of articles delivered in transverse alignment by the belt 5, the outermost article will be delivered to the assembly table 9 at the bottom level, the next article in the transverse row will be delivered at an elevation slightly greater than the thickness of one article above the first mentioned article, and so on, across the row as shown more fully in Fig. 7.

The chains are supported in proper position by channel members 46, one for each pair of chains, having sprockets at their outer ends, that is, the ends adjacent the table 9. The chains are supported between the side walls of the channels, whereby the channel web serves as a brace for the chains and the flanges of the channel serve as side guides for the articles. These several channels are fixedly supported at their outer ends with their faces in alignment, respectively, with a series of shelves 47 supported in spaced relation one above the other in the article-receiving frame 48. This article receiving frame 48 is in effect a sheet metal box one end of which is provided with inwardly tapering extensions 49 forming a funnel over which the carton C is telescoped by the operator as shown in Fig. 7, while the opposite end is open to receive the packing plungers 10 by which the charge of articles is delivered into the carton. The width of the frame, that is, the distance between two triangular walls, (Fig. 7) corresponds to the horizontal dimension of the carton (when supported on its side in packing position), and between each operation of the packing plunger 10 a sufficient number of articles must be delivered to the assembly frame 48 by the chains 8 to make a complete tier of articles. That is to say, if the transverse dimension of the carton is four times the corresponding dimension of the article, four separate rows of six articles each must be delivered to the assembly frame by the chains 8 between each operation of the plungers 10.

The operation of the plungers is controlled by the articles themselves and no matter how far apart the separate rows of six advanced by the feed chains 8 may be, the plungers will not operate until four complete tiers have been delivered to the assembly frame. To this end there is provided the electrical control mechanism shown diagrammatically in Fig. 10. This mechanism comprises a switch 50 whose movable part consists of a push button 51 which projects through the outer side wall of the article frame 48 as shown in Fig. 3 in position to be engaged by the article when advanced by the uppermost pair of chains 8, and is pushed inwardly to make contact when a complete line of articles (in this case too) has been delivered to the topmost shelf 47 in the frame. This operation of the switch 50 closes the circuit through a solenoid 51<sup>a</sup> to the core of which is attached, as shown in Fig. 7, an operating rod 52 which serves to release a one-revolution clutch 53 to thereby operate the packing plungers through one complete reciprocation.

The clutch 53 comprises a continuously driven toothed member loose on the shaft 54 of the clutch, to which shaft is attached the pawl carrying driven member 55 and also the crank

56 of the oscillating arm 57 which operates the cross head 58 of the packing plungers. The pawl 59 of the one-way clutch is provided with an outwardly projecting arm positioned to be engaged by a stop roller 60 on a rock arm 61 which is rocked into a position to release the pawl when the solenoid is energized and into position to engage the projecting arm of the pawl when the circuit is broken, the weight of the core serving when no longer held up by the current through the solenoid to force the rod 52 downwardly and thereby through the toggle levers 62, to rock the arm 61 into position for the roller to engage the pawl and release the clutch.

The control mechanism also embodies a second switch 63 in series with the switch 50 whereby both switches must be closed in order for the solenoid to be energized to release the clutch. The switch 63 is operated as shown in detail in Fig. 9 and comprises a cam 64 attached to the rock shaft 64' supported in suitable bearings on a bracket 65 projecting from the table top beneath the carton-supporting funnel 49. Fast to the shaft 64' is an arm 66 which serves to hold the carton telescoped on the funnel 49. A spring 67 (see Fig. 1) normally holds the arm in the upright position shown in Fig. 7, the purpose of the spring and arm being to partially support the weight of the filled carton while it is being lowered to the roller table 68 upon which the filled cartons are discharged. The cam 64 of the switch 63 is so shaped as to maintain the switch contact when the arm is in vertical position and to break the contact when the arm is lowered to discharge the carton.

The arm 66 is held in both horizontal and vertical positions by means of two pawls 68', 71 which engage a ratchet 69 also fast on the shaft 64', as shown in Fig. 8. The pawl 68 is provided with a crank arm 70 by means of which the operator may readily release the pawl to allow the arm to return to vertical position when an empty carton has been placed on the funnel. The second pawl, 71, is provided for holding the arm yieldingly against reverse movement. This pawl works against a rounded tooth 72 which permits the shaft to turn when sufficient force is applied; hence the carton will be held firmly in position to receive the articles, but may be readily lowered when a complete charge of articles has been deposited in the carton.

It will be observed in Fig. 7 that because of the horizontal spacing between the articles on conveyors 8 there is a progressively decreasing space between the ends of the plungers 10 and the articles on the shelves of the assembly frame 48. On the operation of the plungers through the one-way clutch as above described, movement of the bottom row of articles in their advance toward the carton will commence before the movement of the row immediately above, and so on. Or, otherwise stated, the bottom row of articles is given the greatest movement on each operation of the plunger and each successive row above a somewhat lesser movement, the purpose of this arrangement being to take up the spaces between the articles to thereby bring the articles in vertical alignment in their passage into the carton.

In Fig. 7 the articles marked A<sup>2</sup> indicate the positions of the articles making up one row, at the end of the movement effected by the belts 8 while the articles marked A<sup>3</sup> are in the positions to which the articles constituting the row marked A<sup>2</sup> are moved by the first operation of the plunger. Upon the next operation of the plunger 78

the articles in row A<sup>3</sup> will be advanced the width of one article only.

Before starting the machine the shelves and funnel will preferably be filled with articles arranged in the manner illustrated in Fig. 7, and thereafter on each operation of the plunger one complete vertical tier of articles will be discharged into the carton. In the machine shown the carton is of a depth to accommodate four tiers of articles and hence at each fourth operation of the plunger the carton will be filled and removed from the machine and replaced by an empty carton. If the operator neglects to remove the filled carton the operation of the plunger will serve to eject the carton from the funnel, which will be lowered by the arm 66 onto the roller table, thereby, through the switch 63, breaking the circuit through the solenoid and preventing further operation of the plunger until the operator has placed a fresh carton on the funnel and restored the arm to its vertical position.

It is believed the operation of the machine will be sufficiently understood from the foregoing description. It will be observed that no matter to what extent there may be gaps in the incoming lines of articles, even to the extent of one or more lines being completely stopped, the machine will automatically operate to advance complete rows of articles to the assembly frame and that the plungers will operate only when a complete tier of articles, of both vertical and horizontal rows has been assembled.

It will be further observed that throughout the operation of the machine there is no relative movement of the articles with respect to each other while in contact except the slight vertical movement effected by the inclined bridges 43, which movement is just sufficient to allow the guide rods 42 to enter between the articles and separate them into separate rows.

The particular advantage of the machine is that the movement of the articles from one horizontal plane to another, which is necessary to provide a charge of multiple layers, is accomplished by continuously moving belts, thereby avoiding the necessity of intermittently shifting the assembled articles or the carton containing the articles to permit the successive layers to be superimposed one on the other. The intermittently actuated parts are hence all of comparatively light weight so that they may be rapidly operated without producing undue vibration of the machine.

In the attached drawings and foregoing description we have disclosed one embodiment of our invention which has been found in actual practice to be satisfactory and efficient. It will be understood, however, that the invention is not limited to the construction specifically disclosed except insofar as defined in the appended claims.

We claim:

1. In a machine for packaging articles, a support on which the articles are assembled, a plurality of conveyors for feeding the articles to said support, said conveyors being arranged to deliver the articles to the support at points displaced from each other both vertically and horizontally, the number of said conveyors corresponding to the number of horizontal layers of articles in the completed package, and means for transferring articles from said support into a carton.

2. In a machine for packaging articles, a support on which the articles are assembled, means for feeding the articles to said support in suc-

sive rows oblique to the vertical, and means for advancing the articles on said support in echelon arrangement, the successive rows forming a stack of articles, and for discharging a vertical row of articles from the end of said stack into a carton. 5

3. In a machine for packaging articles, a support on which the articles are assembled, means for feeding the articles to said support in a plurality of horizontal rows arranged obliquely with respect to each other, means for advancing said horizontal rows of articles in echelon arrangement to form a vertical tier and discharge said tier into a carton. 10

4. In a machine for packaging articles, a support on which the articles are assembled, means 15 for feeding articles to said support in successive oblique lines, and means for advancing the articles on said support step by step in echelon arrangement to form a plurality of horizontal lines of articles said advancing means being arranged 20 to impart progressively increasing movement from the uppermost to the lowermost of said horizontal rows so as to take up the spaces between the articles and bring corresponding articles in each row into vertical alinement to form a tier 25 for insertion into a carton.

5. In a machine for packaging articles, a support on which the articles are assembled, means for feeding articles to said support in successive oblique rows, and a plurality of plungers mounted 30 upon a common support and arranged in stepped formation for engaging the articles on said support and advancing them step by step in echelon arrangement to form a vertical tier and discharge said tier into a carton. 35

6. In a machine for packaging articles, means for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, mechanism for receiving the articles from said conveying means and rearranging them in horizontal rows in different vertical planes, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled, means for conveying said rows of articles to said support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers in the completed 50 package, and means for transferring the articles from said support into a carton. 55

7. In a machine for packaging articles, means for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, mechanism for receiving the articles from said conveying means and rearranging them in horizontal rows in different vertical planes, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled, means for conveying said rows of articles to said support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers in the completed package, means for transferring the articles from said support into a carton, and means controlled by the articles in one of said levels for initiating the 70 operation of said transferring means. 60

8. In a machine of the class described a support for receiving articles to be packed into a carton, means for assembling articles on said support in position to be placed in the carton, power 75

operated means for discharging said articles into the carton, and means for holding a carton in filling position adjacent said support including a rock-arm adapted to engage the carton to hold it horizontally at the filling position and aid in lowering and turning the carton from horizontal filling position to upright position, and means actuated by said rock-arm to withdraw the application of power to said discharging means when the carton is moved away from filling position and to restore the application of power thereto when the rock-arm is returned to the filling position.

9. In a machine for packaging articles, a support on which the articles are assembled, a conveyor for advancing the articles to be packed in successive horizontal rows each containing articles in number corresponding to the number of layers in the completed package, a plurality of conveyors for delivering the articles from said first named conveyor to said support, some of said conveyors being directed downwardly toward said support and other of said conveyors being directed upwardly toward said support, the articles being delivered to said support at a plurality of levels corresponding to the number of horizontal layers in the completed package, and means for discharging articles from said support into a carton.

10. In a machine for packaging articles, a support for receiving the articles to be packed, means for assembling the articles in tiers on said support, means for discharging articles on said support into a carton, means controlled by the articles on said support for initiating the operation of said discharging means, a movable support for holding the carton in filling position, and means controlled by the movement of said support away from filling position for stopping the operation of said article-discharging means.

11. In a machine of the class described, a support for receiving articles to be packed in a carton, means for assembling articles on said support in position to be placed in the carton, means for discharging said articles into the carton, and means for holding a carton in filling position adjacent said support including a rock-arm adapted to engage the carton to hold it horizontally at the filling position and aid in lowering and turning the carton from horizontal filling position to upright position, and means actuated by said arm to stop the operation of said article-discharging means when the carton is moved away from filling position.

12. In a machine of the class described, a support for receiving articles to be packed in a carton, means for assembling articles on said support in position to be placed in the carton, means for discharging said articles into the carton, and means for holding a carton in filling position adjacent said support including a rock-arm adapted to engage the carton to hold it horizontally at the filling position and aid in lowering and turning the carton from horizontal filling position to upright position, a spring connected to turn said arm to the carton filling position, a ratchet connected with said arm, a pawl engaging said ratchet to hold the arm in lowered position, and a second pawl engaging said ratchet to hold the arm in the filling position.

13. In a machine for packaging articles a support on which the articles are assembled, a plurality of conveyors for feeding the articles to the support, the conveyors being arranged to deliver the articles to the support at points staggered with respect to one another both vertically and

horizontally, the number of conveyors corresponding to the number of horizontal layers of articles in the completed package, and means for transferring articles from the support into a carton.

14. In a machine for packaging articles, a support on which the articles are assembled, a plurality of conveyors for feeding the articles to the support, the conveyors being arranged to deliver the articles to the support at points spaced from each other vertically and staggered with respect to each other horizontally, the number of the conveyors corresponding to the number of horizontal layers of articles in the completed package, and means for transferring articles from the support into a carton.

15. In a machine for packaging articles means for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, means for receiving the articles from said conveying means and rearranging them in horizontal rows, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled in horizontal lines in different vertical planes, means for conveying the rows of articles to the support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers in the completed package, and means for transferring the articles from the support into a carton.

16. In a machine for packaging articles, means for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, means for receiving the articles from the conveying means and rearranging them in horizontal rows, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled in horizontal lines in different vertical planes, means for conveying the rows of articles to the support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers in the completed package, means for transferring the articles from the support into a carton, and means controlled by the articles in one of the levels for initiating the operation of the transferring means.

17. In a machine for packaging articles, means for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, means for receiving the articles from said conveying means and rearranging them in horizontal rows, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled in horizontal lines in different vertical planes, means for conveying the rows of articles to the support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers in the completed package, and means for advancing said horizontal lines of articles in echelon arrangement to form a stack and for discharging a vertical tier of articles from the end of the stack into a carton.

18. In a machine for packaging articles, means

for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, means for receiving the articles from said conveying means and rearranging them in horizontal rows, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled in 10 horizontal lines in different vertical planes, means for conveying the rows of articles to the support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers 15 in the completed package, a plurality of plungers mounted upon a common support and arranged in stepped formation for engaging the articles on the support and advancing them step-by-step

in echelon arrangement to form a vertical tier and discharge said tier into a carton.

19. In a machine for packaging articles a support on which the articles are assembled, a plurality of conveyors for feeding the articles to the support, the conveyors being arranged to deliver the articles to the support at points displaced from each other both vertically and horizontally, the number of conveyors corresponding to the number of horizontal layers of articles in the completed package, and a plurality of plungers mounted upon a common support and arranged in stepped formation for engaging the articles on the support and advancing them step-by-step in echelon arrangement to form a vertical tier and discharge said tier into a carton.

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CERTIFICATE OF CORRECTION.

Patent No. 2,109,294.

February 22, 1938.

WALLACE D. KIMBALL, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, second column, lines 9 and 11, claim 3, for the word "rows" read lines; same page and column, lines 17 and 19, claim 4, for "lines" read rows; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of April, A. D. 1938.

(Seal)

Henry Van Arsdale,  
Acting Commissioner of Patents.

for conveying the articles in one or more lines in which the articles are arranged in indeterminate spacing, means for receiving the articles from said conveying means and rearranging them in horizontal rows, in which rows the articles are uniformly spaced and each contains articles in number corresponding to the number of superposed layers in the completed package, a support on which the articles are assembled in 10 horizontal lines in different vertical planes, means for conveying the rows of articles to the support including means for delivering the articles of a row thereto simultaneously at a plurality of levels corresponding to the number of layers 15 in the completed package, a plurality of plungers mounted upon a common support and arranged in stepped formation for engaging the articles on the support and advancing them step-by-step on the support and advancing them step-by-step

in echelon arrangement to form a vertical tier and discharge said tier into a carton.

19. In a machine for packaging articles a support on which the articles are assembled, a plurality of conveyors for feeding the articles to the support, the conveyors being arranged to deliver the articles to the support at points displaced from each other both vertically and horizontally, the number of conveyors corresponding to the number of horizontal layers of articles in the completed package, and a plurality of plungers mounted upon a common support and arranged in stepped formation for engaging the articles on the support and advancing them step-by-step in echelon arrangement to form a vertical tier and discharge said tier into a carton. 15

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