

April 25, 1961

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2,981,042

MEANS FOR PLACING INSERTS BETWEEN CONTINUOUSLY TRAVELING
ARTICLES DURING PACKAGING THEREOF

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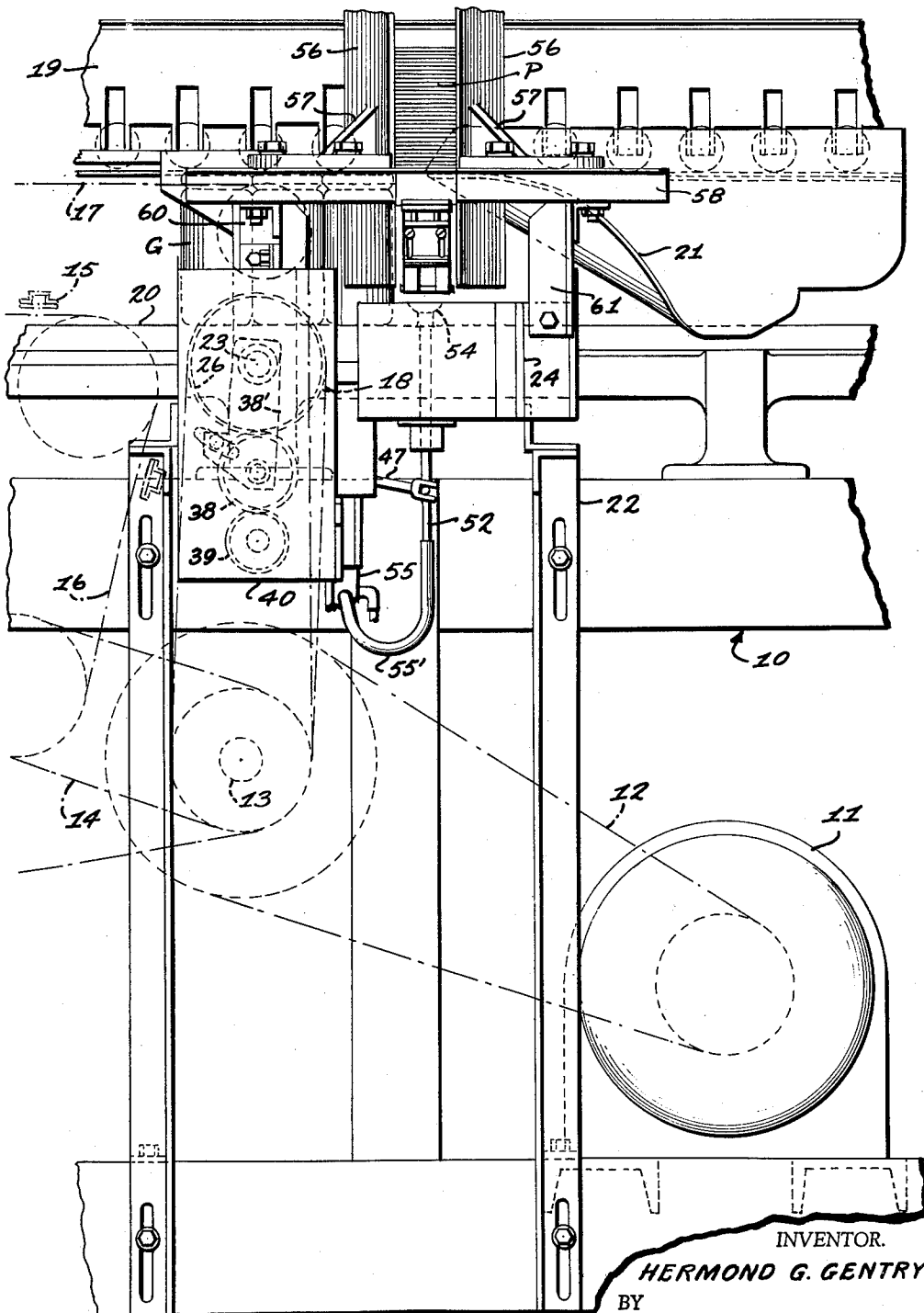


Fig. 1

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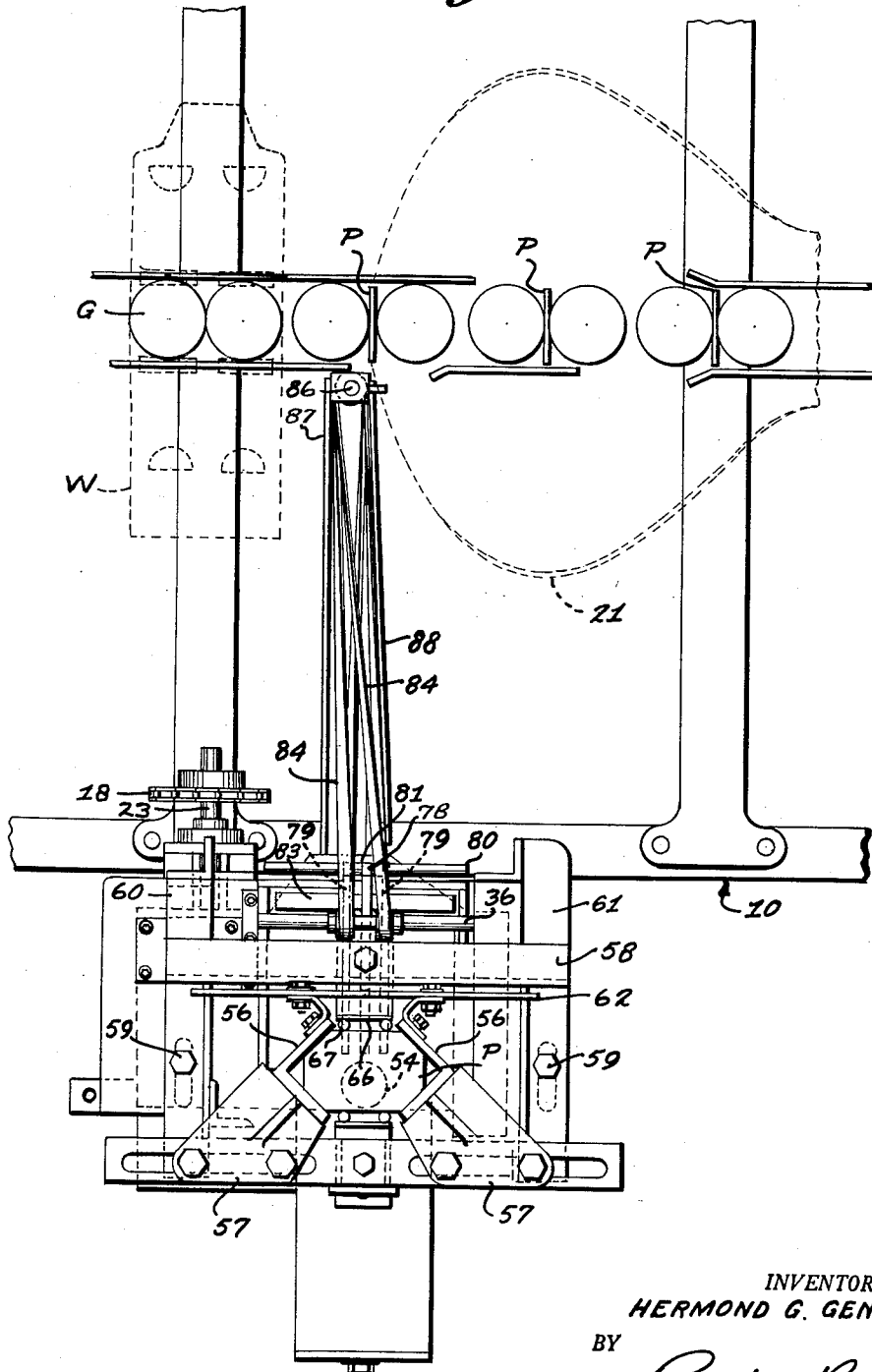
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Fig. 2



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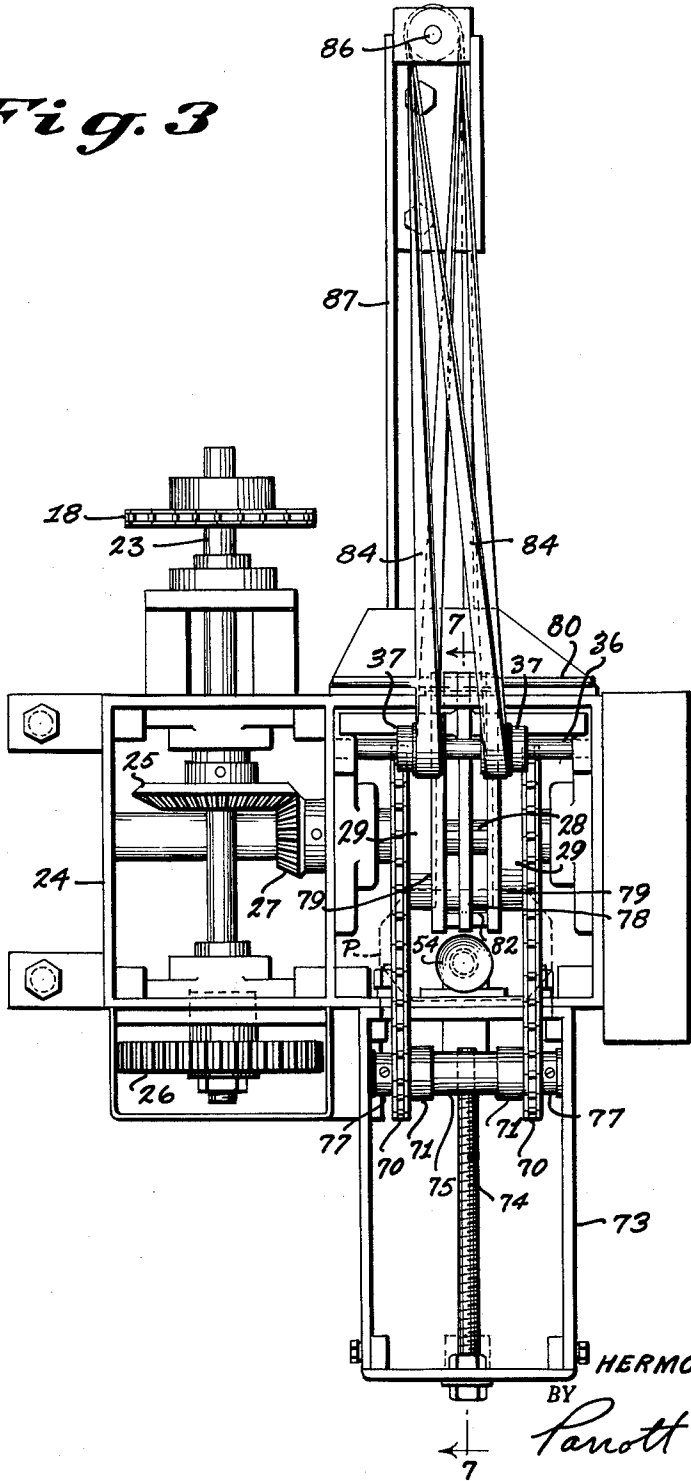
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Fig. 3



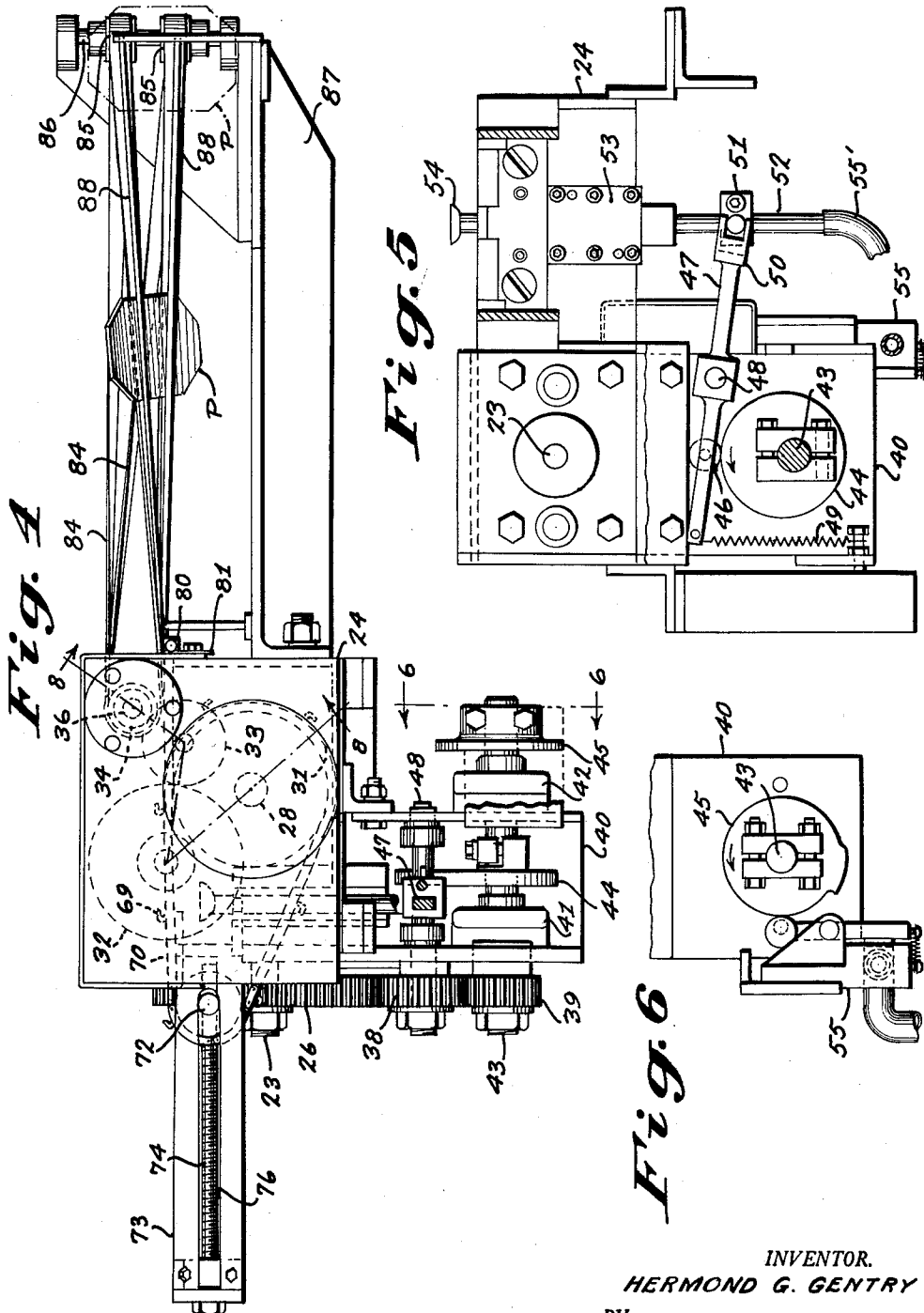
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MEANS FOR PLACING INSERTS BETWEEN CONTINUOUSLY TRAVELING ARTICLES DURING PACKAGING THEREOF

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6 Claims. (Cl. 53-157)

This invention relates generally to the packaging of articles in paperboard wrapper blanks or cartons of the type adapted to be folded and secured about a group of articles to form an open-ended merchandising package or the like, and more particularly to the packaging of articles in this manner while maintaining the articles traveling continuously and while placing partition elements or other inserts transversely between the articles being packaged.

A representative wrapper type package incorporating partition elements such as might be inserted between the articles therein according to the present invention is disclosed in copending application Serial No. 683,149, filed September 10, 1957, in which the package arrangements illustrated and described contain glassware articles with partition elements disposed in separating relation therebetween. It is also desirable in other instances to place inserts of various sorts between the articles in this type of package, such as inserts that may serve as coasters or mats for the articles after removal from the package, or novelty inserts of one sort or another for promotional purposes or the like.

The general packaging of articles in wrapper blanks can be done advantageously in apparatus of the type disclosed in U.S. Patent No. 2,751,730, issued June 26, 1956, in which the articles to be packaged are maintained traveling continuously during the packaging operation, and the present invention makes it possible to place inserts automatically between the articles being packaged in apparatus of this sort without interrupting or complicating in any way the continuous packaging operation being carried out.

According to the present invention, the inserts are placed automatically between the articles being packaged as they are caused to travel continuously in successive package groups, the placing of the insert being done by a delivery conveyor disposed sidewise of and extending to the continuously traveling package groups, and a hopper feeder arranged to transfer the inserts serially from a supply thereof to the delivery conveyor, together with means for operating the hopper feeder and the delivery conveyor in timed relation to the continuous travel of the package groups of articles through the apparatus.

These and other features of the present invention are described in further detail below in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevation showing means arranged according to the present invention for inserting partition elements or the like between articles of package groups in the course of continuous packaging thereof;

Fig. 2 is a fragmentary plan view corresponding generally to Fig. 1;

Fig. 3 is an enlarged plan of the partition inserting means of the present invention with the hopper section and top cover plates removed;

Fig. 4 is a right side elevation corresponding generally to Fig. 3, but shown partly in section and partly broken away;

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Fig. 5 is a left end elevation corresponding generally to Fig. 4, but partly in section and partly broken away;

Fig. 6 is a fragmentary detail substantially as seen at the line 6-6 in Fig. 4;

Fig. 7 is a sectional detail taken substantially along the line 7-7 in Fig. 3; and

Fig. 8 is an extended compound sectional detail illustrating the arrangement of the gear train provided along the line 8-8 in Fig. 4.

Referring now in detail to the drawings, the illustrated embodiment of the present invention is shown in Figs. 1 and 2 arranged for operation on packaging apparatus of the type disclosed in the previously noted U.S. Patent No. 2,751,730, the frame structure for this apparatus being indicated fragmentarily at 10 with drive means arranged thereon at 11 from which a driving connection 12 runs to a shaft at 13, which shaft 13 is in turn connected at 14 for: (1) driving a series of package group separating plungers as indicated at 15 carried on traveling sprocket chains indicated at 16; (2) driving wrapper blank feed chains indicated at 17 by which wrapper blanks W (see Fig. 2) are registered in continuously traveling relation with the package groups of articles, such as glass jars G, separated by the traveling plungers 15; and (3) driving at 18 the partition inserting means of the present invention by which partition elements P are associated with the continuously traveling package groups of jars G; all in timed relation.

Figs. 1 and 2 show the portion of the packaging apparatus at which the package groups of jars G have been separated and brought, with the registered wrapper blanks W extending across the top thereof, beneath an overhead weighting means 19 provided to maintain the package groups separate and the wrapper blanks aligned therewith as the continuous travel thereof proceeds on a supporting conveyor means indicated at 20, while the separating plungers 15 and wrapper blank feed chains 17 are withdrawn to clear the package groups of jars G for downward folding of the aligned wrapper blanks W at the sides thereof by side folding means such as is illustrated at 21; and it is just prior to this side folding of the wrapper blanks W that the partition elements P are placed between the jars G of the successive package groups by the inserting means of the present invention, which is arranged for operation at this location on a mounting bracket 22 attached to the packaging apparatus frame structure 10.

The input drive at 18 for the partition inserting means suitably comprises a chain driven sprocket wheel carried at one end of an input shaft 23, which is journaled in a housing frame 24 (see Fig. 3) and also carries a bevel gear 25 intermediate its length and a spur gear 26 at the other end thereof. The input shaft 23, as journaled in the housing frame 24, extends transversely with respect to the path of the package groups of jars G traveling through the packaging apparatus, and the bevel gear 25 carried thereon engages a bevel pinion 27 carried at the adjacent end of a cross shaft 28 also journaled in the housing frame 24 parallel to the path of the traveling jars G.

The cross shaft 28 extends to the right as seen in Fig. 3 to carry a pair of sprocket wheels at 29, and to reach at its other end within a housing structure 30 on the right side of the housing frame 24 to carry the initial gear 31 of a gear train arranged within this housing 30 as indicated in Fig. 4 and illustrated further in Fig. 8. The gear train within the housing 30 further comprises a compound gear 32 having a pinion element engaging the initial gear 31, and a change gear element engaging a complementary idler pinion 33, which in turn drives a final gear 34 that is fixed on a rotatably mounted stud 35 arranged to have a countershaft 36 pinned therewith for

driving a pair of timing belt pulleys 37 (compare Figs. 3 and 8).

A further gear train is arranged from the previously mentioned spur gear 26 carried by the input shaft 23, as illustrated in Figs. 1, 4, and 7. This further gear train comprises an intermediate gear 38 driving a final camshaft gear 39 from the input shaft gear 26. A lower housing portion 40 is mounted on the housing frame 24 to carry the intermediate gear 38 adjustably to support journal bearings at 41 and 42 for a camshaft 43 on which the final gear 39 is mounted. The camshaft 43 extends to the right as seen in Figs. 4 and 7 with an eccentric arranged thereon at 44 (compare Fig. 5) and a cam at 45 (compare Fig. 6).

The camshaft eccentric 44 is arranged in relation to a follower roll 46 that is carried on a fulcrumed lever arm 47, the follower roll 46 being disposed between the lever pivot axis at 48 and an end of the lever arm 47 at which a return spring 49 is connected. The lever pivot axis 48 is formed by a pivot shaft mounted in the lower housing portion 40, and the return spring 49 is anchored on the housing portion 40 to maintain the follower roll 46 riding the eccentric 44. The other end of the lever arm 47 is fitted with a yoke block 50 engaging a pivot block 51 fixed on a vacuum tube 52 that is slidably disposed in a bearing block 53 for vertical lifting and lowering to present a suction cup 54 at the upper end thereof for gripping a partition element P of a hopper supply when lifted and transferring the gripped partition element P for feeding when lowered. Suction is impressed on the vacuum tube 52 at the lower end thereof through a flexible hose connection at 55' from a valve 55 carried on the lower housing portion 40 for actuation from the previously mentioned cam 45.

The partition element hopper supply is arranged in vertical alignment above the suction cup 54 within a hopper structure that is illustrated in Figs. 1, 2 and 7 as comprising a pair of upright hopper framing members 56 that are spaced to contain a stacked supply of horizontally disposed partition elements P therein. The hopper framing members 56 are formed with mounting bracket portions 57 arranged for attachment at elongated slots in a hopper supporting frame 58 so as to provide for setting the spacing of the framing members 56 in accordance with the proportions of the partition elements P being handled. The supporting frame 58 is in turn adjustably attached at each side thereof, as indicated at 59 in Fig. 2, to upright support brackets 60 and 61 that are fixed on the housing frame 24 and extend upwardly therefrom. The hopper framing members 56 are further stabilized by an adjustable cross brace structure arranged at their upper ends as illustrated in Figs. 2 and 7 at 62.

In order to support a supply of partition elements P stacked upwardly within the hopper framing members 56 for removal downwardly therefrom by the suction cup 54, the hopper supporting frame 58 is fitted with mounting blocks 63 and 64 (compare Figs. 2 and 7) that are arranged to have angle brackets 65 attached adjustably thereto, as seen best in Fig. 7, for supporting retainer spring plates 66 in opposed relation at the opposite spacings between the hopper framing members 56. Each of the retainer spring plates 66 have ball elements 67 fixed adjacent their lower corners at the inner faces thereof, and the angle brackets 65 also carry backing plates 68 for adjustment to dispose a lower lip portion thereof in backing relation with respect to the spring plate ball elements 67, so that the spring plates 66 may be set to support the stacked partition element supply adequately at the ball elements 67 thereon, while allowing the bottom partition element P to be gripped and readily pulled downwardly from the hopper structure by the suction cup 54.

The partition elements P removed successively from the hopper structure in this manner are lowered by the suction cup 54 into the path of regularly spaced pairs of

hooks 69 carried on feeder chains 70 to engage the trailing edge of each partition element P for feeding. The feeder chains 70 run on the previously mentioned sprockets 29 driven by the bevel gear cross shaft 28, and on idler sprockets 71 carried by a spindle shaft 72 adjustably arranged in a mounting frame 73 for positioning in relation to length of feeder chains 70 required for a particular size of partition element P. Positioning of the spindle shaft 72 in the mounting frame 73 is accomplished by an adjustment screw 74 extending through a threaded bore in an enlarged central section 75 of the shaft 72 for setting the position of the shaft ends in elongated slots 76 extending in each side of the mounting frame 73 and in which the shaft ends are slidably arranged beyond lateral spacers 77.

Upon lowering of the partition elements P into the path of the feeder chain hooks 69, the leading edge portion thereof is placed on a central and two side supporting arms 78 and 79 that extend between the feeder chains 70 from a mounting rod 80 carried on a bracket 81 attached to the housing frame 24. The extending end of the central support arm 78 rests at the top surface of a bracket 82 attached to the vacuum tube bearing block 53 for this purpose, and a lateral carrying bar 83 is attached at the lower side of the central support arm 78 in spaced relation from its mounted end for maintaining the side supporting arms 79 disposed level therewith while allowing their spacing to be adjusted sidewise on the mounting rod 80.

The feeder chains 70 deliver the partition elements P successively on the supporting arms 78 and 79 beneath a pair of timing belts 84 driven by the pulleys 37 on the countershaft 36. These timing belts 84 run from the drive pulleys 37 to idler pulleys 85 that are carried on a vertical shaft 86 mounted at the extending end of a supporting boom structure 87, so that the timing belts 84 are twisted 90° in running between the pulleys 37 and 85 to provide for turning the partition elements P from their horizontal feeding position to an upright disposition for insertion between the jars G. This turning of the partition elements P is accomplished by the timing belts 84 in association with rod members 88 that are supported on the boom structure 87 to extend beyond the supporting arms 78 and 79 at the respective twisting lines of the timing belts 84 to have the partition elements P ride thereon as they are conveyed for timed insertion between the jars G of the continuously traveling package groups as previously noted, the delivery action of the timing belts 84 being so rapid as to effect the partition insertion momentarily at the proper intervals as the jars G pass in the packaging apparatus.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. Apparatus for packaging articles in wrapper blanks comprising means for maintaining said articles traveling continuously in successive package groups of the size to be packaged in said wrapper blanks, and means for placing inserts transversely between articles of each of said continuously traveling package groups prior to wrapping said blanks thereon, said last mentioned means including a delivery conveyor operating sidewise of said continuously traveling package groups for placing said inserts upon delivery in transverse separating relation between articles thereof, a hopper feeder arranged to transfer said inserts serially from a supply thereof to said delivery conveyor, and means for operating said hopper feeder and delivery conveyor in timed relation to the continuous travel of said package groups.

2. Apparatus for packaging articles in a wrapper blank with partition elements or the like disposed transversely between the packaged articles, said apparatus comprising means for maintaining said articles traveling continuously

in successive package groups of the size to be packaged in said wrapper blanks, and means for inserting said partition elements transversely between the articles of said continuously traveling package groups prior to wrapping said blanks thereon, said last mentioned means including a delivery conveyor disposed sidewise of said continuously traveling package groups and extending transversely thereto for placing said partition elements upon delivery in transverse partitioning relation between the articles of said package groups, a hopper feeder arranged to transfer said partition elements serially from a supply thereof to said delivery conveyor for insertion between said articles, and means for operating said hopper feeder and said delivery conveyor in timed relation from said means maintaining said article package groups traveling continuously, said hopper feeder operating to transfer said partition elements with a horizontal disposition to said delivery conveyor, and said delivery conveyor incorporating a pair of belts running about a horizontal axis at one end for receiving said transferred partition elements and about a vertical axis at the other end for delivering said partition elements uprightly for insertion.

3. Apparatus as defined in claim 2 and further characterized in that the partition elements received from said hopper feeder are conveyed by said pair of belts for delivery while riding on a pair of rod members disposed at the respective twisting lines of said belts.

4. Apparatus as defined in claim 2 and further characterized in that said hopper feeder comprises a pair of upright framing members spaced for containing a stacked supply of horizontally disposed partition elements therein, and a pair of retainer plates disposed in opposed relation at the opposite spacings between said framing members adjacent the lower ends thereof, each of said retainer plates having ball elements fixed adjacent their lower corners at the inner faces thereof and being supported laterally to position said ball elements for supporting a stacked partition element supply within said framing members while allowing the bottom partition element of said

supply to be pulled downwardly from said framing members.

5. Apparatus as defined in claim 4 and further characterized in that said hopper feeder additionally comprises a suction cup arranged in vertical alignment with a stacked partition element supply within said framing members for raising to grip the bottom partition element of said supply and lowering to remove said bottom partition element from the supply and place it in the path of means for feeding said removed bottom partition element to said delivery conveyor, said last mentioned means including a stationary supporting structure extending to have the leading edge portion of said removed partition element placed thereon and to carry said partition element as it is fed to said delivery conveyor by said feeding means.

6. In packaging apparatus of the character described, means for inserting partition elements or the like during the packaging operation of said apparatus, said inserting means comprising a hopper feeder and a delivery conveyor; said hopper feeder being arranged for containing a stacked supply of horizontally disposed partition elements and including means for successively removing the bottom partition element downwardly from said supply and feeding means for successively transferring said removed partition elements horizontally from beneath said stacked supply; said delivery conveyor operating about a horizontal axis at one end for successively receiving partition elements transferred by said hopper feeder and about a vertical axis at the other end for delivering said partition elements uprightly for insertion.

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