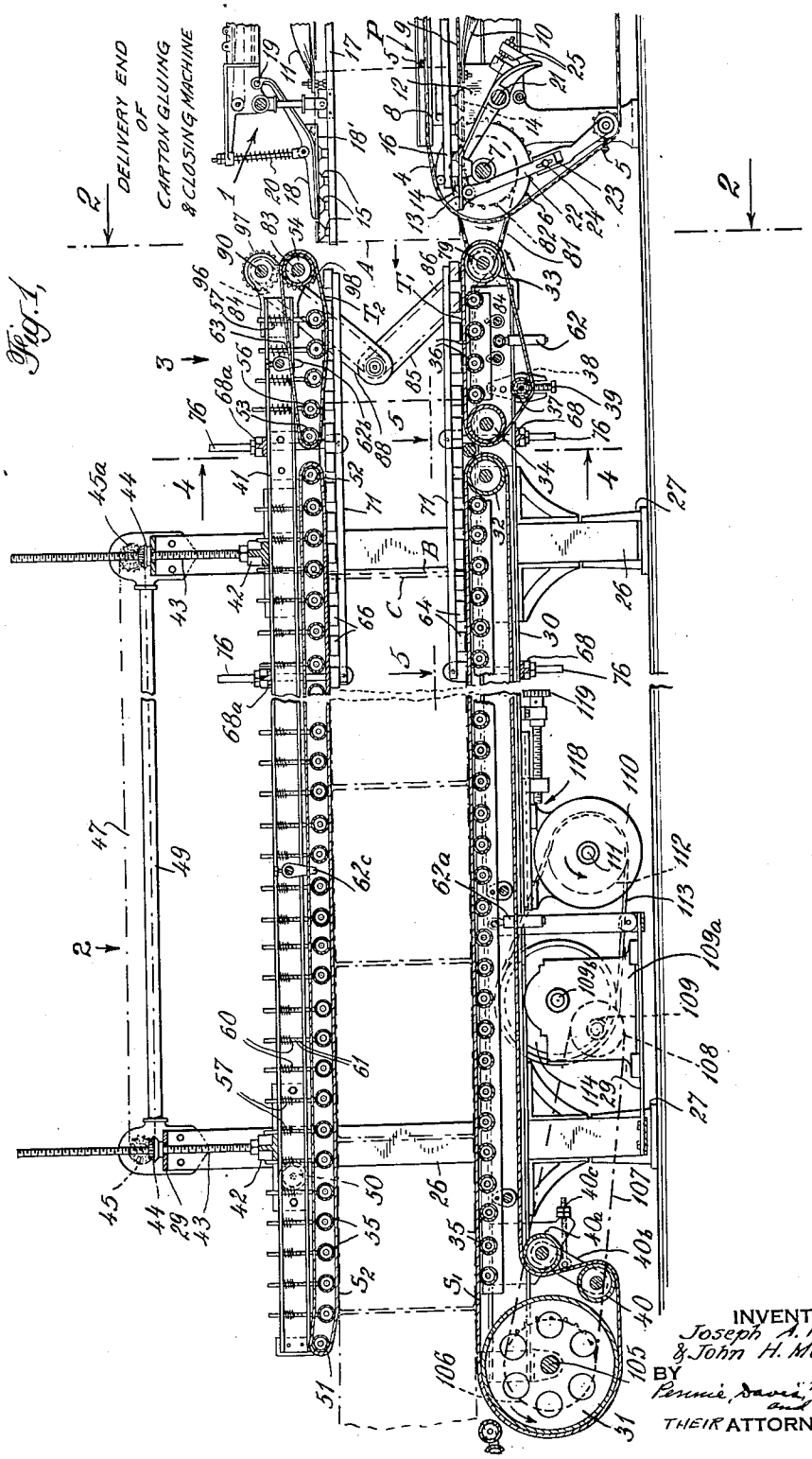
Nov. 8, 1938. J. A. FERMANN ET AL 2,135,806

CARTON CLOSING MACHINE

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Fig. 1.



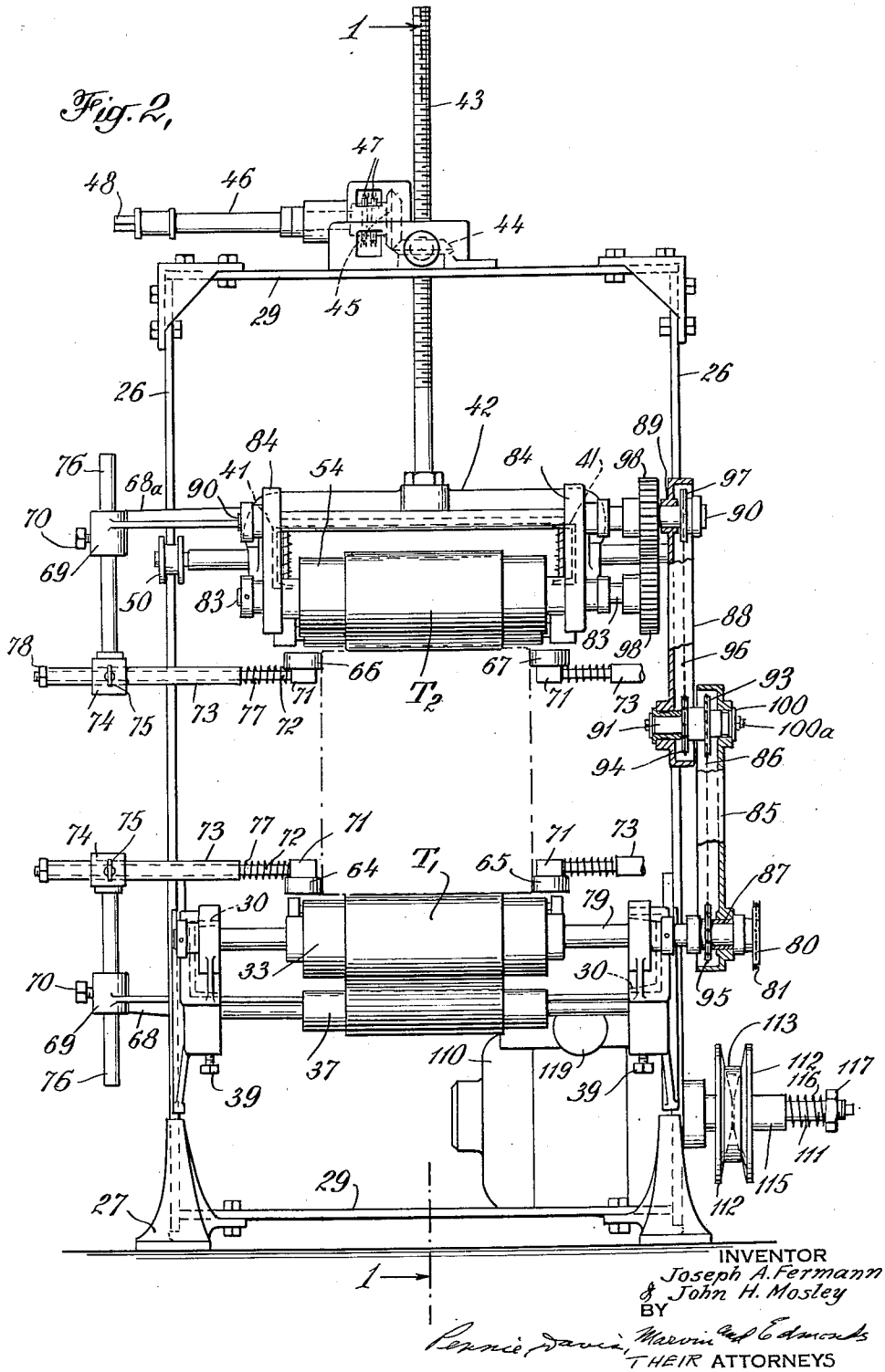
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Fig. 2.



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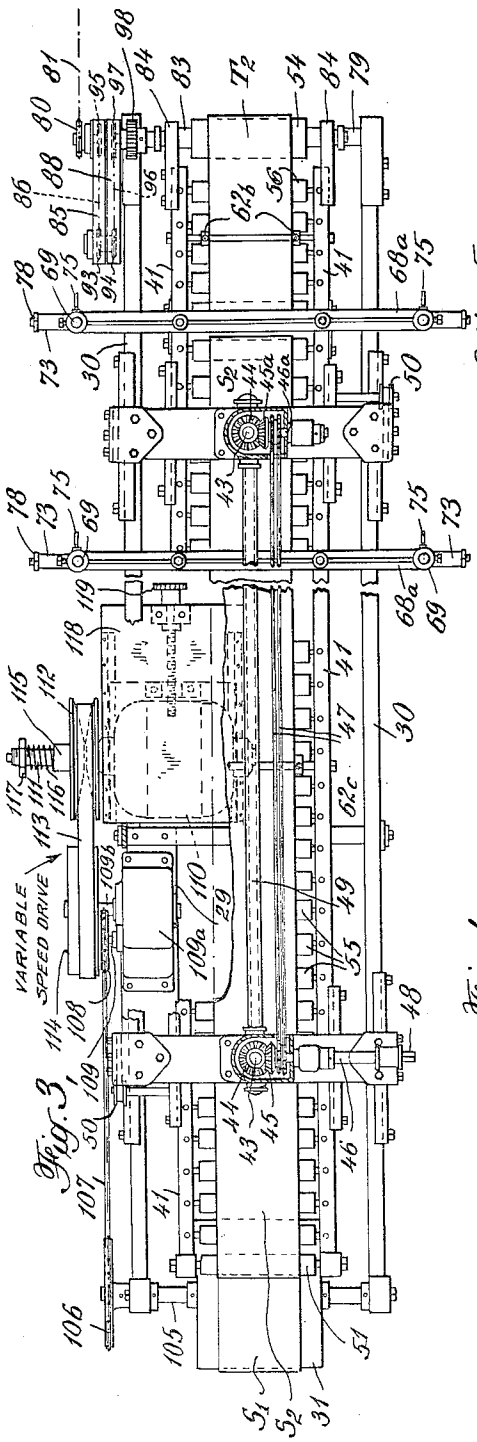


Fig. 3.

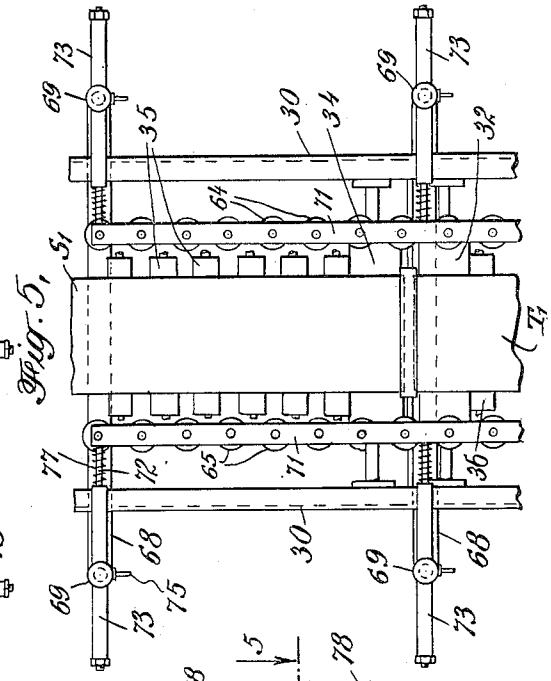


Fig. 5.

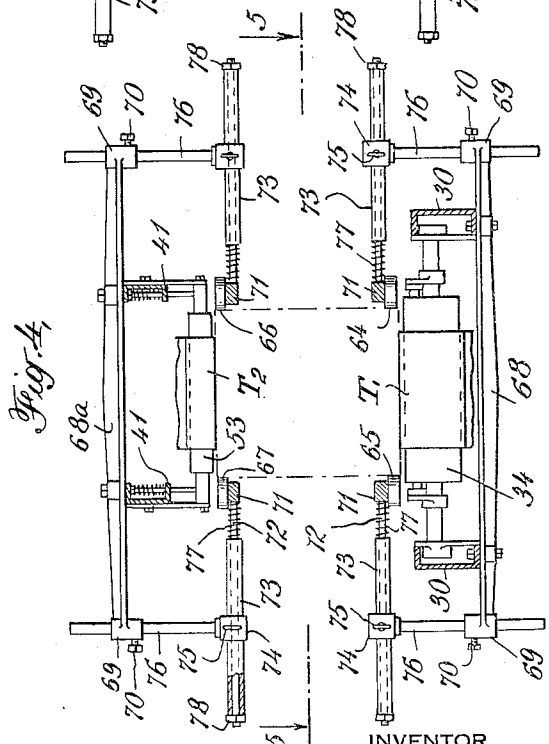


Fig. 4.

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Fig. 6.

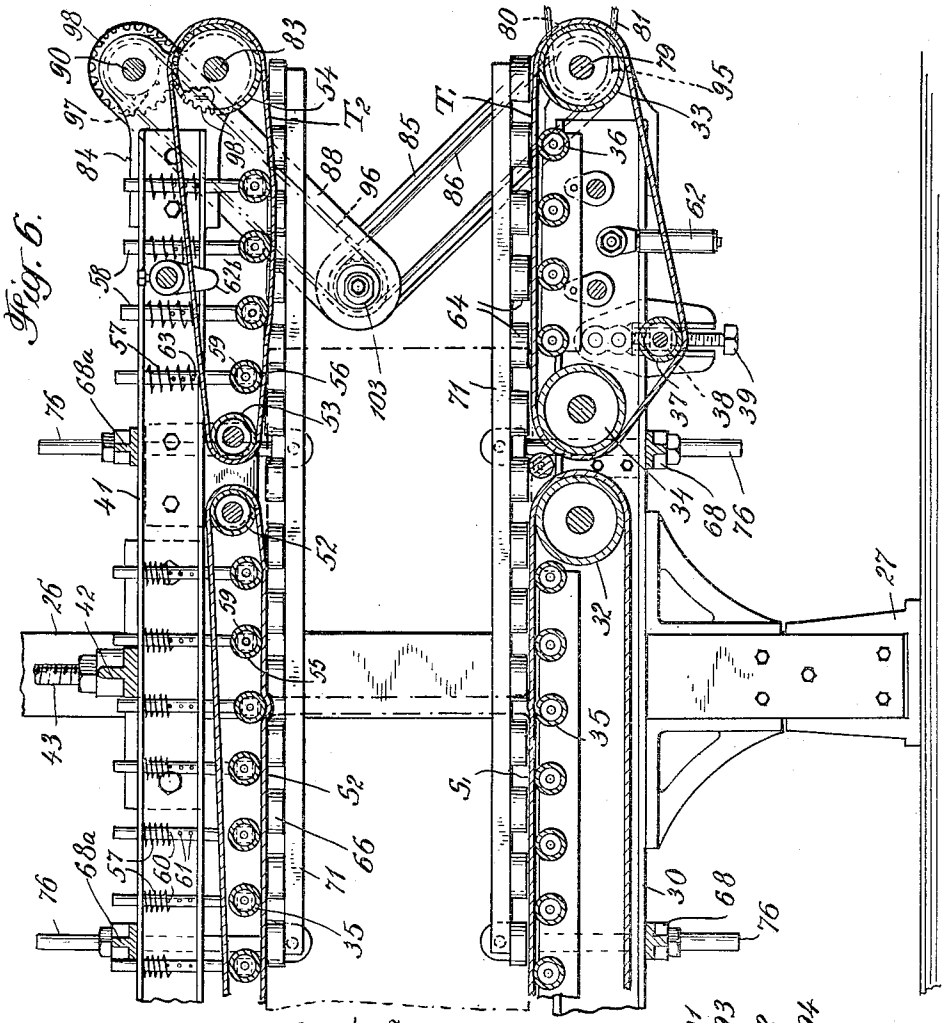


Fig. 7.

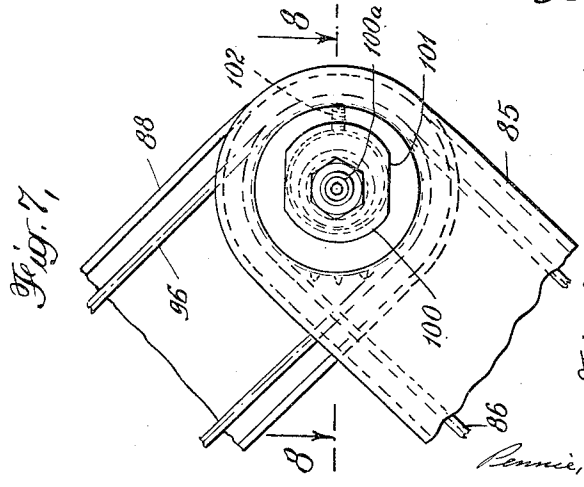
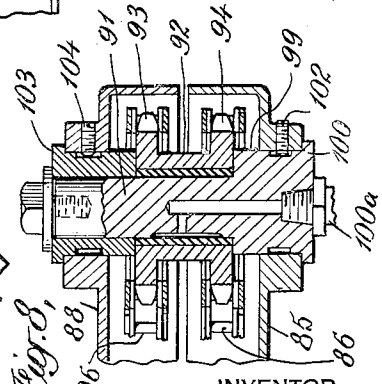


Fig. 8.



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UNITED STATES PATENT OFFICE

2,135,806

CARTON CLOSING MACHINE

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Application July 6, 1936, Serial No. 89,032

25 Claims. (Cl. 93—6)

This invention relates to machines for closing and sealing filled cartons, that is to say, packing or shipping cases made of corrugated or fiber board and filled with heavy articles, such, for example, as packages of cereal, or cans containing food, beverages, etc.

In closing and sealing such packing cases or cartons, the filled cartons resting on their bottom flaps with these flaps folded to closed position, but unsealed, are first passed through a gluing apparatus. By means of this apparatus both the bottom and top outer flaps are unfolded and adhesive is applied, after which these flaps are again folded to closed position in contact with the inner closed flaps of the carton. From this gluing apparatus the cartons are delivered to a compression apparatus for applying pressure to the upper and lower surfaces of the cartons so as to hold the surfaces of the flaps in close contact for a sufficient length of time for the adhesive to set to a degree which will permit the cartons to be handled without danger of the flaps becoming unsealed.

The cartons are advanced through the gluing apparatus by means of a propelling device which operates at substantially constant speed. On account of the nature of the operations of folding, gluing and refolding the flaps, the cartons proceed through the gluing machine spaced a substantial distance apart, that is to say, a distance of the order of the length of the cartons. The propelling device usually consists of spaced pusher bars which extend transversely of the apparatus and are carried by a pair of endless chains mounted on sprocket wheels located at each end of the gluing apparatus.

The pressure applying apparatus usually comprises a pair of vertically spaced belts each of about the same width as the cartons to be operated upon. The upper reach of the lower belt, and the lower reach of the upper belt are each provided with backing means for maintaining the respective surfaces of the belts each in the same plane. The backing means for the upper belt is usually spring mounted and capable of vertical adjustment, both to regulate the amount of sealing pressure to be applied to the flaps, and for the purpose of adjusting the machine for cartons of different heights. The lower belt is power driven so as to propel the cartons through the apparatus.

If the cartons were run through the pressure applying apparatus in the same spaced relation in which they necessarily pass through the gluing apparatus, the pressure applying apparatus would have to be so long as to occupy an inordinate amount of floor space in order to maintain the cartons under sealing pressure for a sufficient length of time for the adhesive to properly set. It is desirable, therefore, that the cartons should be passed through the sealing pressure apparatus in substantially end-to-end contact, and heretofore in order to provide for such operation, an arm for operating a switch in the circuit of the driving motor of the sealing pressure apparatus has been mounted for actuation by the cartons as they enter this apparatus. When a carton was delivered to the sealing pressure apparatus by the gluing apparatus, the forward end of the carton moved this arm sufficiently to close the switch and start the driving motor. This motor continued to drive the lower belt of the sealing pressure apparatus until after the switch operating arm was disengaged from the rear end of the carton. Then the switch was opened and the carton stopped with its rear surface at the entrance of the sealing pressure apparatus.

When the next carton was delivered by the gluing apparatus, the front thereof was advanced immediately substantially into end-to-end contact with the rear of the preceding carton. The driving motor of the sealing pressure apparatus was again started and both cartons were advanced another carton length through the sealing pressure apparatus.

The apparatus just described has been found to operate sucessfully and many installations are now in commercial operation and have been for a considerable number of years.

The object of the present invention is to provide a carton closing and sealing apparatus which possesses even greater advantages than the former apparatus.

It has been found that as the gluing apparatus has been improved so as to enable its speed of operation to be increased, thereby delivering cartons to the pressure applying apparatus at a higher rate, that the increased frequency of operation of the starting switch and of the driving motor of the sealing pressure apparatus has caused trouble to be experienced with this apparatus. In addition, inasmuch as the driving belt of the sealing pressure apparatus is at rest for about one-half of the time, when it is in motion it must be brought up to and operated at a comparatively high speed in order to advance the cartons through the apparatus fast enough to take care of the output of cartons from the glu-

ing apparatus. This high belt and carton speed requires that the driving motor operate at high speed, and, consequently, a considerable length of time is consumed in acceleration and deceleration.

Various attempts have been made heretofore to adjust the speed of the sealing pressure apparatus with respect to the speed of the propelling bars which push the cartons through the gluing apparatus so that the cartons will issue from both the gluing apparatus and the compression apparatus at the same rate, but enabling the sealing pressure apparatus, instead of operating intermittently, to operate continuously at a speed sufficiently low to cause the cartons issuing from the gluing apparatus in widely spaced relation to be received by the sealing pressure apparatus in substantially end-to-end contact. It was necessary to provide a transfer conveyor for moving the cartons from the gluing apparatus and delivering them to the sealing pressure apparatus. Without this device each carton would be jammed against the pusher bar of the gluing apparatus because the advance of the carton would be restrained either by the slower moving belts of the sealing pressure apparatus, or by contact with the preceding carton therein.

In such apparatus as heretofore constructed, on account of the fact that the transfer conveyor must be operated at a speed which is higher than the speed of the propelling mechanism of the gluing apparatus, it has been difficult to avoid the displacement of the outer flaps of the carton with respect to the inner flaps. Inasmuch as these surfaces are freshly glued and have just been brought into contact by the gluing apparatus, and inasmuch as the forces of acceleration and deceleration are applied to the carton through the outer flaps, it is extremely difficult to handle the cartons without causing displacement. It is important, however, to avoid displacing the flaps inasmuch as it tends to reduce the strength and impair the appearance of the sealed carton.

The object of the present invention is to overcome this difficulty and provide carton gluing and sealing apparatus wherein the cartons move continuously therethrough and issue therefrom with their flaps sealed in the proper position.

With some types of adhesive, if the flaps, after being coated with adhesive and brought into adhering contact with one another, and held in this position even for a comparatively short length of time, are then shifted one with respect to the other, there is a tendency to weaken the joint between the flaps. The cause for this is that when the partially set adhesive is once disturbed it will not again cause the flaps to adhere to one another in such a way as to form a joint of full strength. Therefore, the invention aims also to provide an apparatus in which the carton flaps when once closed and placed in proper position are not thereafter shifted out of this position.

Another feature of the invention is to provide a transfer mechanism having two power driven belts which is readily adjustable for cartons of different height.

Another object of the invention is to improve the arrangement of the driving motor and speed-varying means for the sealing pressure apparatus, making it compact and readily accessible.

The invention will be understood from a consideration of the accompanying drawings which, by way of example, show one embodiment of the invention. In these drawings:

Fig. 1 is a view in vertical central section taken on line 1—1 of Fig. 2 of the sealing pressure or compression apparatus and the transfer mechanism, and including the delivery end of a carton gluing and closing machine;

Fig. 2 is a view in elevation of the transfer mechanism and sealing pressure apparatus taken on line 2—2 of Fig. 1;

Fig. 3 is a plan view of the sealing pressure and transfer mechanism of Fig. 1 with certain parts broken away in order to reveal other parts below;

Fig. 4 is a view in vertical section taken on line 4—4 of Fig. 1 looking toward the right as indicated by the arrows, illustrating the details of the mechanism for confining the sides of the carton;

Fig. 5 is a fragmentary, horizontal section taken on line 5—5 of Figs. 1 and 4, showing further details;

Fig. 6 is an enlarged view of a portion of Fig. 1; and

Figs. 7 and 8 are views illustrating details of the driving mechanism between the two belts of the transfer mechanism or conveyor, Fig. 8 being a section taken on line 8—8 of Fig. 7.

Referring now to the accompanying drawings, the apparatus of our present invention comprises a carton gluing and closing apparatus indicated generally by numeral 1 (only the delivery end thereof being illustrated in the drawings), a compression apparatus indicated by reference numeral 2 by means of which the freshly glued flaps of the cartons are maintained under appropriate sealing pressure until the adhesive has set sufficiently to enable the cartons to be handled, and a transfer mechanism indicated generally by reference numeral 3.

As will be more fully described presently, the cartons are pushed through the gluing apparatus at constant speed but in spaced relation by means of a propelling device indicated generally by reference character P. This propelling mechanism operates at the same speed for various sizes of cartons, since the speed of the cartons through the gluing apparatus is determined by the ability of the flap manipulating and gluing devices to handle the flaps, and this is independent of the length or height of the carton.

The carton shown in position A is just issuing from the gluing apparatus and is about to be delivered to the compression apparatus 2 by means of the transfer mechanism 3. The compression apparatus comprises a pair of endless belts S_1 and S_2, preferably of about the same width but slightly narrower than the cartons. The speed of belts S_1 and S_2 is such as to deliver the cartons at the left hand end of the compression apparatus at the same rate at which the cartons issue from the gluing machine, but the cartons in the compression apparatus are arranged substantially in end-to-end contact, which will be understood to mean, either actually touching one another, or spaced apart, say, from about ½" to about 1", to permit circulation of air between the cartons to facilitate the setting of the adhesive.

As shown in Fig. 1, the compression apparatus 2 is broken away at the center. The length of this depends upon the character of the cartons, the adhesive, and the rate at which the cartons are passed through the apparatus. The length is sufficient, however, to allow the adhesive to set sufficiently so that the cartons can be handled without causing the flaps to be loosened.

The belts T_1 and T_2 of the transfer mechanism 3 are both driven at the same speed, this speed being higher than the speed of propelling mechanism P and considerably higher than the speed

of the compression apparatus 2. These belts engage the front end of a carton issuing from the gluing apparatus 1 shortly after the carton has advanced a short distance beyond position A, and rapidly accelerate the carton and shift it through the transfer mechanism to the position B where the carton is abruptly decelerated either by contact of the front end of the carton with the rear end of the next preceding carton at position C in the compression apparatus, or by the compression belts S_1 and S_2 which are travelling at a much lower speed than belts T_1 and T_2.

The above will serve to explain the general operation of the apparatus of the present invention.

The carton gluing and closing apparatus 1 is provided with appropriate mechanism for gluing, that is to say, applying adhesive to both the top and bottom flaps of cartons, and then folding these flaps to closed position and delivering the cartons successively with both the inner and outer top and bottom flaps in proper position and alinement, and squared with the sides of the carton. The cartons are passed through this machine in spaced relation. As they travel through the machine the flaps are brought into engagement with the manipulating devices. These open up the outer flaps into a position such that the adhesive can be readily applied thereto, then apply the adhesive to the outer or inner flaps, either or both, but preferably to the outer flaps only, and then refold the outer flaps to closed position with their inner edges parallel and the outer corners of the carton squared up.

Although other types of carton gluing and sealing apparatus may be used, the apparatus of which the delivery end is shown in the accompanying drawings is of the type illustrated and described in the copending application of Wallace D. Kimball and Cornelius I. Braren, Serial No. 21,790, filed May 16, 1935, and assigned to the same assignee as the present application. The cartons are propelled through this machine by means of a pair of chains 4, one arranged on each side of the machine, and which carry pusher bars 5 appropriately spaced apart along the chains.

These chains are carried around sprockets 6 which are fixed to a cross shaft 7, and this shaft is driven at constant speed by any suitable means, such, for example, as an electric motor (not shown). In order to support the cross bars 5 so that they will engage the rear end of the cartons at an appropriate distance above the bottom of the cartons, suitable supports such as that indicated at 8 are provided. The carton, as it advances through the gluing and closing machine, is supported upon a table or platen 9. After the carton passes the adhesive applying device of this machine, the outer carton flaps are refolded to closed position by means of warped surface refolders. The end portions of these refolders for the bottom flaps are indicated by numeral 10 and these refolders for the upper flaps by numeral 11.

As the cartons move off the end of platen 9, they are supported by means of an adjustable exit plate 13.

As the carton leaves the gluing and closing machine, both the lower and side edges of the cartons are squared up by means of a series of conical headed rollers 14 arranged along each side of the carton near the bottom, and a second series of similar rollers 15 near the top. The lower rollers 14 are carried on carton guide bars 16 and the upper series by guide bars 17. The lower rollers 14 press the outer carton flaps, which are hinged along the side edges of the carton, inwardly against the side edges of a fin member 12. These outer bottom flaps are held against the inner bottom flaps by the exit plate 13.

The upper conical rollers 15 force the outer or side flaps of the top of the carton inwardly so that the inner edges of these flaps are forced against a second fin member 18' which extends longitudinally and centrally of a presser plate 18. These flaps are held in closed position by means of this plate 18 which is pivoted to the frame of the machine at 19 and which is biased downwardly by means of a helical spring 20. Fin members 12 and 18' are each about ⅛" in thickness and serve to prevent the inner edges of the outer flaps from being forced into overlapping relation as the cartons are squared up by the tapered rollers 15.

The adjustable exit plate 13 is pivoted to the frame of the machine at 21, and is supported at its outer end by a bar 22 made in two sections which are slidably connected at 23. By loosening a nut 24, the elevation of exit plate 13 can be adjusted with respect to the height of platen 9 and the elevation of the front end of the transfer mechanism 3.

Fin 12 is a triangular plate having at its lower right hand corner a projecting rod square in cross section at its upper end and rounded and threaded at its lower end. To support fin 12 the squared portion of the rod and lower corner of the fin plate fit snugly within an open rectangular slot in a wide projection or boss extending upwardly from plate 13 near its pivot 21. The lower threaded end of this rod extends through an aperture in a second boss adjacent the first, and the height of the upper edge of fin 12 can be adjusted by means of the nuts 25.

The compression apparatus 2 and transfer mechanism 3, as shown in Fig. 1, are carried upon a single frame. This frame comprises four upright members 26 having feet 27 and connected by longitudinal channel members 30 and, as shown in Fig. 2, by cross members 29.

The lower belt S_1 of the compression apparatus, and the lower belt T_1 of the transfer mechanism are supported upon the channel bars 30 which are bolted in fixed position by means of suitable brackets upon the uprights 26. Belt S_1 at its ends is trained over rollers 31 and 32 which are carried in journals supported by the channel members 30.

The lower transfer belt T_1 is supported at its ends by the rollers 33 and 34 (see Fig. 6). A series of closely spaced rollers 35 support the upper reach of belt S_1 forming a backing to enable the belt to exert a substantially uniform pressure throughout its length upon the lower surface of the carton. Similar rollers 36 support the upper reach of transfer belt T_1. In order to stretch belts S_1 and T_1 tightly over their respective table or supporting rollers 35 and 36, each of these belts is provided with an adjustable take-up mechanism. This mechanism for transfer belt T_1 consists of a roller 37 mounted on brackets attached to the lower channel members 30. These brackets carry journal boxes 38 for the spindles of roller 37 which slide in vertical ways in the brackets. The position of these journals in the ways can be varied by turning bolts 39.

Roller 31 at the left hand end of the compression apparatus serves to drive lower belt S_1 and in order to provide ample traction without requiring too high a tension on this belt, this roller is of large diameter, as will be seen from Fig. 1. The take-up mechanism for belt S_1 performs the additional function of raising the lower reach of this belt above the bottom of channels 30 for a purpose which will hereafter appear. This take-up mechanism comprises two comparatively small diameter rollers 40 and 40_a. Roller 40_a serves to elevate the lower reach of the belt to the desired point and is journaled in brackets adjacent the bottom channels 30. Roller 40 is carried at the lower ends of a pair of adjustable arms 40_b which are pivoted on the shaft of roller 40_a. These arms are held in adjusted position by means of a threaded rod and nut arrangement 40_c.

In order to make the compression apparatus and transfer mechanism adjustable for different heights of cartons, the upper belts S_2 and T_2 are mounted for vertical adjustment. These belts are supported beneath and by means of a pair of vertically adjustable channel bars 41. Bars 41 are held in fixed spaced relation and are supported by hangers 42, one opposite each pair of uprights 26. Hangers 42 are suspended from the lower ends of vertical threaded rods 43 having nuts 44 which engage the upper surface of cross members 29.

In order to adjust rods 43 up or down simultaneously so as to maintain belts S_2 and T_2 parallel with belts S_1 and T_1, nuts 44 are provided with bevelled gear teeth which mesh respectively with the teeth of similar bevelled gears 45 and 45_a which are mounted on short horizontal shafts 46 and 46_a. These shafts are connected for simultaneous rotation by means of a pair of endless chains 47 which are carried on suitable sprockets fixed to these shafts. Shaft 46 is extended outwardly to the side of the machine, as shown in Fig. 3, and slabbed at its end, as indicated at 48, to receive a turning crank. To take the reactions of chains 47, a distance rod 49 connects the centers of cross members 29.

For the purpose of positioning channel bars 41 longitudinally and providing guiding means for guiding the superstructure in its upward and downward adjusting movement and for maintaining the same properly in position, two narrow double-flanged rollers 50 are mounted as shown in Figs. 1, 2 and 3, to cooperate with the outer vertical edges of two of the uprights 26. These rollers are mounted on horizontal arms secured to and extending outwardly from each of the channels 41.

Belt S_2 is carried at its outer ends by rollers 51 and 52 which are journalled in brackets attached to the channel members 41. Belt T_2 is carried at its ends by means of rollers 53 and 54 which are similarly mounted. The lower reaches of both of belts S_2 and T_2 are backed by means of spring pressed rollers, belt S_2 by rollers 55 and belt T_2 by rollers 56. The resilient mounting of these rollers stretches the lower reaches of each of these belts taut and maintains them each in a single plane. The resilient mounting also, in the case of belt S_2 enables the compression apparatus to apply to the opposed top and bottom surfaces of the carton an appropriate pressure to hold the glued surfaces of the flaps in proper intimate contact so that when the adhesive is set these flaps will firmly adhere to one another.

In the case of the transfer belts T_1 and T_2 the resilient mounting of rollers 56 affords a means of causing the belts to apply the appropriate tractive effort or force to the upper and lower surfaces of the carton to accelerate the same away from the pusher bars 5 of the gluing apparatus and then allow the carton to decelerate as it is fed into the slowly moving compression belts S_2 and S_1 substantially without displacing the flaps, in spite of the fact that these flaps are freshly glued and that all of the accelerating force is applied to the carton and its contents through these freshly glued flaps. Also, while the cartons are decelerating and the transfer belts T_1 and T_2 are sliding over the lower and upper surfaces thereof, the flaps are not displaced.

The appropriate tension is applied to rollers 55 and 56 of the compression and transfer apparatus by means of helical springs 57 (see Fig. 6) surrounding vertical rods 58 which have journals 59 for the rollers attached at their lower ends and which are arranged to slide vertically in apertures provided in appropriately spaced relation in the horizontal flanges of channel members 41. The upper ends of these coil springs 57 bear against the lower surfaces of the upper channel flanges while the lower end of each spring engages a cotter pin 60 which may be placed in any one of a number of cotter pin holes 61 which are provided in the lower portion of each of rods 58.

The rollers 56 for resiliently backing the upper transfer belt T_2 are mounted in the same way as just described in connection with rollers 55 for the compression apparatus belt S_2. Moreover, the helical springs for applying the yielding pressure to rollers 56 may be identical with springs 57 and the difference in pressure applied to the two belts obtained by placing the springs for rollers 56 under a smaller initial tension. This may be done by placing the cotter pins 63 in one of the lower cotter pin holes.

It has been found advantageous also under certain conditions of operation to cause the pressure applied between transfer belts T_1 and T_2 to decrease as the cartons proceed toward the compression apparatus 2. This can be readily accomplished by providing additional cotter pin holes in the rods 58 for rollers 56 and placing the cotter pins of the rollers toward the right hand end of the transfer mechanism 3 in some of the intermediate holes and the cotter pins toward the left hand end in some of the lower cotter pin holes.

It is desirable that the transfer belts T_1 and T_2 and the compression apparatus belts S_1 and S_2 run centrally on their supporting rollers and in alinement with one another. To accomplish this, a pair of vertically mounted rollers 62 is provided, one coacting with each opposite edge of the lower reach of belt T_1. The vertical axes upon which these rollers turn are supported at their upper ends by brackets which are adjustably secured to a transverse tie rod which may be seen at the right hand portion of Fig. 6. The lower compression unit belts are similarly guided by the rollers 62_a shown in Fig. 1. These rollers are adjustably mounted like roller 26.

The upper transfer belt T_2 is guided by means of a pair of downwardly extending fingers 62_b which are adjustably supported upon the tie rod which may be seen in Figs. 6 and 3. Fingers 62_c are similarly mounted to coact with the edges of belt S_2.

For the purpose of assisting in transferring the cartons from the gluing machine to the com-

pression apparatus 2 without displacing their freshly glued flaps, confining means is provided for the sides of the cartons adjacent both the top and bottom thereof. This confining means preferably comprises a series of straight faced rollers arranged in closely spaced relation along each side of the carton close to the bottom and also close to the top thereof, and extending throughout the region of feed from the transfer mechanism to the compression apparatus. Thus, as shown in Figs. 1, 6 and 4, there is provided a series of rollers 64 extending along the lower right hand edge of the carton which is at position B, and also for a short distance before reaching this position. In substantially the same plane on the opposite side of the carton, there is another series of rollers 65. Also at the top of the carton on opposite sides are rollers 66 and 67.

These two pairs or series of rollers are mounted so as to apply suitable pressure to the sides of the carton adjacent the hinges of the outer flaps and thereby assist in preventing these flaps from being displaced and the shape of the carton from being distorted by the application of the tractive effort of the transfer belts to the heavy cartons. For this purpose the rollers are yieldingly mounted and means are provided for adjusting this resilient mounting so as to vary the lateral pressure which is applied to the carton.

The desired mounting for rollers 64 and 65 at the bottom of the carton is provided by means of a pair of transverse members 68 bolted to the lower side of lower channel members 30 and each terminating at both ends in sockets 69 having adjusting screws 70. Rollers 64 are mounted for rotation on a longitudinally extending bar 71, and extending outwardly near each end of this bar are two parallel rods 72. Rods 72 are each slidably carried in a tubular member 73 which in turn is mounted in a socket 74 in which the tubular member may be adjusted horizontally and secured in any desired position by means of the thumb screw 75. Sockets 74 are mounted at the ends of vertical rods 76 which are received in sockets 69.

In order to urge the rollers against the sides of the carton a helical spring 77 surrounds each of the rods 72, one end of which bears against the roller supporting bar 71 and the other end of which bears against the end of tubular member 73. The outer end of each of rods 72 is threaded and provided with a nut 78 which not only holds the assemblage together, but also forms a stop for limiting the inward position of the rollers when there is no carton on the transfer mechanism 3. By this construction it will be understood that tubular members 73 can be adjusted to increase or decrease the compression of springs 77 and therefore the pressure exerted by rollers 64 and 65 against the sides of the carton, and by correspondingly adjusting stop nuts 78, the position of rollers with no carton in the transfer mechanism can be either maintained or shifted as desired.

The manner of supporting rollers 66 and 67 for the upper part of the carton is identical with that just described for rollers 64 and 65, except that the various parts are reversed in position, the transverse member 68_a being placed on top of channel member 41, and the remainder of the elements being suspended from the ends of member 68_a, instead of projecting upwardly therefrom.

The manner of driving the various parts of the machine will now be referred to. As previously mentioned, the propelling mechanism P comprising the endless chain 4 and cross bars 5 is driven at constant speed by a motor (not shown) which is operatively connected with the shaft 7. Roller 33 at the right hand end of the lower transfer belt T_1 and which is fixed to shaft 79, is driven by means of a sprocket 80 mounted on one end of this shaft (see Fig. 2), chain 81 and sprocket 82 on shaft 7. The ratio of the diameter of sprockets 80 and 82 is chosen so that, taking into account the difference in diameters of roller 33 and sprockets 6, the surface speed of belt T_1 will be higher than the linear speed of chain 4 and pusher bars 5. The difference in these speeds is preferably only sufficient to cause the rear end of the carton to be pulled away from the pusher bar 5 before this bar leaves the chain support 8 and commences its downward motion around sprockets 6. In this way, the bar 5 is prevented from scraping the rear surface of the carton which has a tendency to disfigure the same.

The lower reach of the upper belt T_2 of the transfer conveyor is driven at the same speed as the upper reach of belt T_1, and for this reason roller 54 at the right hand end of belt T_2 has the same diameter as roller 33. Roller 54 is fixed to shaft 83, which is journalled in brackets 84 which are secured to the right hand ends of channel members 41.

In order to drive the upper transfer belt T_2 from the lower transfer belt T_1 and at the same time permit the vertical adjustment of the spacing between belts T_2, S_2 and belts T_1, S_1 the following mechanism is provided:

A casting 85 comprising at the same time a frame member and a protective housing for an endless chain 86 is pivoted at 87 to the outer portion of shaft 79 just inside of the sprocket 80. A second and somewhat similar combined housing and frame member 88 is pivoted at 89 to the outer end of shaft 90 which is journalled in the brackets 84 immediately above and parallel with shaft 83 for roller 54. These two frame members 85 and 88 are pivoted together at their opposite ends by means of a stud shaft 91 shown in detail in Fig. 8. These frame members are preferably of equal length and are so arranged that they will swing about the pivot stud 91 something after the manner of the blades of a pair of shears as the channels 41 carrying belts T_2 and S_2 are adjusted with respect to the lower belts T_1 and T_2.

Mounted for rotation upon stud 91 is a short jack shaft 92 having a sprocket 93 at one end and a sprocket 94 at the other. Chain 86 within housing 85 is trained about a sprocket 95 fixed to shaft 79 and also about sprocket 93, thereby serving to drive jack shaft 92. Within housing 88 is a similar chain 96 which is trained about sprocket 94 and a sprocket 97 which is fixed to shaft 90. In order to drive shaft 83 in the proper direction to cause the lower reach of belt T_2 to move in the same direction as the upper reach of belt T_1, gears 97 and 98 are provided to connect shafts 90 and 83.

By means of the jointed frames 85 and 88 together with the power transmission chains 86 and 96, and gearing 97, 98, the two belts T_1 and T_2 are driven the one from the other independently of the adjustment of the transfer mechanism and compression apparatus for the particular height of carton which is to be operated upon.

In order to provide an adjustment for the purpose of taking up the stretch in chains 86 and 96 so as to provide the proper tension upon these

chains, the mechanism illustrated in detail in Figs. 7 and 8 is provided. Stud shaft 91 is arranged with an enlargement 99 at one end forming a shoulder for positioning the double sprocket or jack shaft construction 92—94. This enlargement is eccentric with respect to the stud 91, as shown, so that by turning enlargement 99, the distance between sprockets 94 and 97 can be increased or decreased to take up the slack in the chain. Enlargement 99 has a thin head 100 which is flattened at 101 to receive a wrench for the purpose of making the adjustment, and it is held in adjusted position by means of a set screw 102.

The opposite end of stud shaft 91 is provided with an eccentric bushing 103 which is also flattened, as shown in Fig. 6, and can be turned to adjust the distance between sprockets 93 and 95. Bushing 103 is held in adjusted position by a set screw 104. A connection 100_a for a pressure grease gun is provided in enlargement 99 and suitable passageways are arranged within the stud shaft 91 for lubricating the shaft 92.

From the immediately preceding description, it will be understood that the transfer belts T_1 and T_2 are driven the one from the other, and that one of these belts, namely, T_1 is driven from the propelling mechanism P of the carton gluing and closing machine 1, and that the speed of belts T_1 and T_2 is higher than and bears a direct proportion to the speed of propelling device P. The cartons are propelled through the compression apparatus 2 by means of the lower belt thereof, S_1. The motion is imparted to belt S_2 through the cartons within the apparatus.

Belt S_1 is driven by roller 31 which is fixed to shaft 105. Fixed on this shaft is a sprocket 106 (see Figs. 1 and 3) and a chain 107 drives this sprocket from a smaller sprocket 108 mounted on the outer end of a shaft 109 which is the slow speed shaft of a speed reducing gear contained within a suitable housing. The high speed or driving shaft of the speed-reducer is indicated at 109_b. A driving motor 110 is mounted near the speed-reducer with its shaft 111 parallel to shaft 109_b. This motor is operatively connected to rotate shaft 109_b by means of a variable speed drive which enables a constant speed motor to be used and still permits the speed of belt S_1 to be varied as desired.

This variable speed drive comprises a split pulley 112 on the motor shaft 111, a V-shaped belt 113 and a pulley 114 on shaft 109_b. The inner half of split pulley 112 is fixed to motor shaft 111. The outer half of this pulley is slidably keyed to shaft 111 and provided with a hub 115 over which a helical spring 116 is placed. The inner end of this spring bears against the outer half of pulley 112 while the outer end is confined upon shaft 111 by means of an adjustable hand screw or nut 117. In this way the outer half of pulley 112 is biased towards the inner half by means of spring 116 and the pressure exerted by this spring can be adjusted to vary the tension on belt 113.

The two halves of pulley 112 form a V-shaped groove for belt 113, and motor 110 is suspended from a slidable support 118 for adjustment toward and from shaft 109_b. The motor can be bodily moved in either direction by turning the knurled handle 119. The raising of the lower reach of belt S_1 and the returning of the same on a level above the bottom of channel members 30 permits the suspension of the motor 110 from these channel members. This not only makes for compactness, but also allows the speed control handle 119 to be conveniently located where it can be easily reached to adjust the speed of the machine.

As shown in the drawings the variable speed drive is adjusted to operate belt S_1 at its maximum speed. When it is desirable to reduce the belt speed, handle 119 is turned to move motor 110 farther away from shaft 109_b. This causes the belt 113 which is nonextensible in length to force apart the two halves of split pulley 112, thus causing belt 113 to operate around pulley 112 on a circle of smaller diameter, so that shaft 109_b now rotates at a slower speed.

By means of the variable speed drive just described, it will be understood that the speed of belt S_1 may be varied in infinitely small increments within the range of operation of the variable speed mechanism. In this way the rate of advance of the cartons through the compression apparatus 2 may be adjusted with respect to the rate of delivery of the cartons at the forward end thereof by the gluing apparatus 1 and transfer mechanism 3, so that the cartons will pass through the compression apparatus in substantially end to end contact. In this way full advantage may be had of the compression apparatus, the cartons being allowed to remain therein for the maximum possible length of time with a given length of compression apparatus, or, stating the same thing in different words, the length of the compression apparatus may be reduced to a minimum, thus economizing on floor space and still causing the adhesive on the flaps of the carton to be properly set.

The employment of the two belts T_1 and T_2, both positively driven for transferring the cartons, enables the cartons to be accelerated away from the gluing apparatus even though the accelerating force is applied to the cartons through the freshly glued flaps without substantially displacing these flaps or distorting the carton from its properly squared up condition in which it is delivered by the gluing apparatus. The employment of the confining rollers for confining the sides of the carton as it is fed to the compression belts S_1 and S_2 by the transfer belts prevents the distortion of the carton or the displacement of the freshly glued flaps during this operation.

The "shear" type of drive between the lower transfer belt T_1 and the upper belt T_2 not only provides an effective drive for the upper belt at moderate cost of manufacture, but also enables vertical adjustment of the upper belts of the transfer mechanism and the compression apparatus to be made without requiring separate adjustment of the driving mechanism.

In addition, by means of our invention, we have provided for the application of uniform pressure to both the upper and lower freshly glued flaps of the carton, this pressure extending substantially over the entire area of these flaps and by means of this pressure the carton is accelerated away from the propelling device of the gluing apparatus and fed to the slowly moving belts of the compression apparatus. Although we have disclosed the use of two simultaneously driven belts, each provided with a backing means for producing the desired uniform pressure, it will be understood that this pressure can be applied to the carton by other means within the scope of the appended claims.

It will also be understood that various other changes may be made in the apparatus without departing from the spirit and scope of our invention. For example, other types of variable speed

drive may be employed instead of the particular form which we have disclosed. Other forms of mechanical variable speed apparatus might be employed, or a variable speed motor with appropriate control means may be used. Also, if desired, the transfer mechanism 3 need not be made as a part of the compression apparatus, but may have its own independent supporting structure, or may be attached to the carton gluing and closing machine. Additional changes also within the scope of the invention will no doubt occur to those skilled in the art.

We claim:

1. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same, and a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said transfer conveyor comprising a pair of power driven belts one coacting with the bottom and the other with the top of said carton, and means for driving both of said belts at the same speed.

2. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, propelling means for advancing cartons therethrough in spaced relation, compressing apparatus operating to maintain sealing pressure upon the closed flaps of a plurality of cartons passing through the same, conveying means for conveying cartons therethrough, a transfer conveyor for removing the cartons one at a time from the flap gluing and closing apparatus and feeding them one at a time to the compression apparatus, said transfer conveyor comprising a pair of power driven belts one coacting with the bottom and the other with the top of the cartons, means for driving both of said belts at the same speed, and means for adjusting the speed of the conveying means for the compression apparatus in relation to the respective speeds of the transfer conveyor and said propelling means so as to cause the cartons to pass through the compression apparatus substantially in end-to-end contact.

3. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, propelling means for advancing a plurality of cartons therethrough in spaced relation, compressing apparatus operating to maintain sealing pressure upon the closed flaps of a plurality of cartons passing through the same, conveying means for conveying cartons therethrough, a transfer conveyor for removing cartons one at a time from the flap gluing and closing apparatus and feeding them one at a time to the compression apparatus, said transfer conveyor comprising a pair of power driven belts one coacting with the bottom and the other with the top of said carton, means for driving both of said belts at the same speed, and yielding pressure applying means for one of said belts, the pressure applied to the carton thereby while the carton is acted upon by the compression apparatus and transfer conveyor simultaneously being less than the pressure applied by said compression apparatus whereby the transfer conveyor can operate at higher speed than the conveying means for the compression apparatus without causing displacing of the freshly glued and closed flaps.

4. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, propelling means for advancing a plurality of cartons therethrough in spaced relation, compressing apparatus operating to maintain sealing pressure upon the closed flaps of a plurality of cartons passing through the same, conveying means for conveying cartons therethrough, a transfer conveyor for removing cartons one at a time from the flap gluing and closing apparatus and feeding them one at a time to the compression apparatus, said transfer conveyor comprising a pair of power driven belts one coacting with the bottom and the other with the top of said carton, means for driving both of said belts at the same speed, and yielding pressure applying means for one of said belts, the pressure applied to the carton thereby while the carton is acted upon by the compression apparatus and transfer conveyor simultaneously being less than the pressure applied by said compression apparatus whereby the transfer conveyor can operate at higher speed than the conveying means for the compression apparatus without causing displacing of the freshly glued and closed flaps, and means for adjusting the speed of said conveying means relative to the speeds of the transfer conveyor and said propelling means to cause the cartons to pass through the compression apparatus in substantially end-to-end contact.

5. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same, and a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said transfer conveyor comprising a pair of power driven belts one coacting with the bottom and the other with the top of said carton, each of said belts being provided with backing means so as to maintain a pressure upon the closed freshly glued flaps while transferring the carton from the flap gluing and closing apparatus to the compression apparatus, and means for driving both of said belts at the same speed.

6. A machine for sealing filled cartons comprising the combination of flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same, and a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said transfer conveyor including means for applying a pressure to the bottom and top surfaces of the carton which decreases as the carton nears the compression apparatus.

7. In a machine for sealing filled cartons including flap gluing and closing apparatus, and compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said transfer conveyor comprising a power operated transfer element, means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton during transfer, and yielding pressure-applying means acting upon the sides of the carton opposite the hinges of the flaps during transfer whereby the freshly glued flaps are substantially prevented from displacement.

8. In a machine for sealing filled cartons including flap gluing and closing apparatus, and compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing

through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor comprising a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton during transfer, and yielding pressure applying means acting upon the sides of the carton opposite the hinges of the flaps as it leaves the transfer conveyor and as it enters the compression apparatus thereby preventing the tractive effort of the transfer element from displacing the freshly glued flaps.

9. In a machine for sealing filled cartons including flap gluing and closing apparatus, and compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor including a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, and having means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton, and means for confining the sides of the carton as it leaves the transfer conveyor and as it enters the compression apparatus, said means comprising series of rollers mounted to engage the opposite sides of the carton adjacent both the upper and lower surfaces thereof.

10. In a machine for sealing filled cartons including flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor including a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, and means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton, means for confining the sides of the carton as it leaves the transfer conveyor and as it enters the compression apparatus, said means comprising a plurality of supports each carrying a series of rollers, one pair of said supports being mounted on opposite sides of the carton in a plane near the top thereof, and another pair of said supports being mounted on opposite sides of the carton in a plane near the bottom thereof, and means for vertically adjusting said supports to bring said rollers opposite the hinges of said outer flaps.

11. In a machine for sealing filled cartons including flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor including a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, and means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton, means for confining the sides of the carton as it leaves the transfer conveyor and as it enters the compression apparatus, said means comprising a plurality of supports each carrying a series of rollers, one pair of said supports being mounted on opposite sides of the carton in a plane near the top thereof, and another pair of said supports being mounted on opposite sides of the carton in a plane near the bottom thereof, and means for mounting said supports for lateral adjustment to accommodate cartons of different width.

12. In a transfer conveyor for machines for sealing filled cartons, a pair of endless belts mounted in vertically spaced relation to receive a carton therebetween, means for driving said belts at the same speed imparting tractive effort to the carton through the upper and lower flaps thereof simultaneously, a frame for supporting the lower belt and a carriage for supporting said upper belt, means for relatively adjusting said frame and carriage to accommodate cartons of different height, a pair of supports each carrying a series of rollers adapted to engage the opposite sides of the carton near the bottom thereof, a second pair of supports carrying rollers adapted to engage the opposite sides of the carton near the top, means mounted on said frame for supporting said first pair of supports, means mounted on said carriage for supporting said second pair of supports to cause said rollers to be adjusted simultaneously with the vertical adjustment of said belts, and means for adjusting said supports relative to said frame and carriage to bring said rollers opposite the hinges of the upper and lower flaps.

13. In a transfer conveyor for machines for sealing filled cartons, a pair of endless belts mounted in vertically spaced relation to receive a carton therebetween, means for driving said belts at the same speed imparting tractive effort to the carton through the upper and lower flaps thereof simultaneously, a frame for supporting the lower belt and a carriage for supporting said upper belt, means for relatively adjusting said frame and carriage to accommodate cartons of different height, a pair of supports each carrying a series of rollers adapted to engage the opposite sides of the carton near the bottom thereof, a second pair of supports carrying rollers adapted to engage the opposite sides of the carton near the top, brackets mounted on said frame for supporting said first pair of supports, and brackets mounted on said carriage for supporting said second pair of supports to cause said rollers to be adjusted simultaneously with the vertical adjustment of said belts.

14. In a transfer conveyor for machines for sealing filled cartons, a series of confining rollers adapted to engage one side of the carton and having a support for mounting the same in adjustable position, and a second series of confining rollers adapted to engage the opposite side of a carton having a support comprising a vertically adjustable bracket having a horizontal aperture therein, a tubular sleeve adjustably mounted in said aperture, a bar carrying said series of rollers having a rod projecting therefrom and passing through said sleeve, a helical spring on said rod between said bar and the adjacent end of said sleeve, and an adjustable

stop coacting with the opposite end of said sleeve for positioning the rollers under the resilient action of said spring.

15. In an apparatus of the class described, a pair of supports arranged in spaced parallel relation one above the other and each carrying an endless belt, one of said belts being adapted to coact with the bottom and the other with the top of a carton, means for adjusting said supports relative to each other to accommodate cartons of different height, traction rollers for said respective belts having shafts journalled in said supports, means for driving one of said belts, and means for drivingly connecting the other belt with said driven belt comprising a jointed frame pivoted to said supports, and transmission means carried by said frame and operatively connected with the traction roller shafts to cause the rotary movement of the traction roller shaft of said driven belt to be transmitted to the other of said shafts.

16. In an apparatus of the class described, a pair of supports arranged in spaced parallel relation one above the other and each carrying an endless belt, one of said belts being adapted to coact with the bottom and the other with the top of a carton, means for adjusting said supports relative to each other to accommodate cartons of different height, traction rollers for said respective belts having shafts journalled in said supports, means for driving one of said belts, and means for drivingly connecting the other belt with said driven belt comprising a pair of frame members each having its inner end pivoted to one of said supports, the outer ends of said frame members being connected together by a pivot shaft, said members being adapted to swing about said pivots as said supports are adjusted relative to each other, a rotatable shaft carried by said pivot shaft, and transmission means operatively connecting said rotatable shaft with each of said traction roller shafts whereby rotary movement of one of said shafts is transmitted to the other.

17. In an apparatus of the class described, a pair of supports arranged in spaced parallel relation one above the other and each carrying an endless belt, one of said belts being adapted to coact with the bottom and the other with the top of a carton, means for adjusting said supports relative to each other to accommodate cartons of different height, traction rollers for said respective belts having shafts journalled in said supports, means for driving one of said belts, and means for drivingly connecting the other belt with said driven belt comprising a pair of frame members each having its inner end pivoted to one of said supports, the outer ends of said frame members being connected together by a pivot shaft, said members being adapted to swing about said pivots as said supports are adjusted relative to each other, a rotatable shaft carried by said pivot shaft, a pair of sprockets fixed to said rotatable shaft, a chain connected to one of said sprockets and driven from one of said traction roller shafts, and a second chain driven by the other of said sprockets and operatively connected to the other of said traction rollers.

18. In an apparatus of the class described, a pair of supports arranged in spaced parallel relation one above the other and each carrying an endless belt, one of said belts being adapted to coact with the bottom and the other with the top of a carton, means for adjusting said supports relative to each other to accommodate cartons of different height, traction rollers for said respective belts having shafts journalled in said supports, means for driving one of said belts, and means for drivingly connecting the other belt with said driven belt comprising a pair of frame members each having its inner end pivoted to one of said supports, the outer ends of said frame members being connected together by a pivot shaft, said members being adapted to swing about said pivots as said supports are adjusted relative to each other, a rotatable shaft carried by said pivot shaft, a pair of sprockets fixed to said rotatable shaft, a chain connected to one of said sprockets and driven from one of said traction roller shafts, a second chain driven by the other of said sprockets and operatively connected to the other of said traction rollers, and means for adjusting said pivot shaft in each of said frame members to alter the tension of said chains.

19. A machine for receiving filled cartons whose flaps are freshly glued and closed and applying sealing pressure thereto comprising upper and lower vertically spaced compression belts, upper and lower vertically spaced feed belts in substantial alinement therewith, means for driving at least one of said compression belts to cause cartons to be advanced therebetween, means for driving both of said feed belts at a higher speed than the speed at which said compression belt is driven, means for backing the lower reach of each of said upper belts comprising closely spaced downwardly biased rollers, the biasing means for the rollers of said upper feed belt being arranged to cause said belt to apply to a carton being fed thereby to the compression belts a smaller pressure than the biasing means for the rollers of the upper compression belt whereby the said feed belts slide over the surface of the carton as it is being received between said compression belts.

20. A machine for receiving filled cartons whose flaps are freshly glued and closed and applying sealing pressure thereto comprising upper and lower vertically spaced compression belts, upper and lower vertically spaced feed belts in substantial alinement therewith, means for driving at least one of said compression belts to cause cartons to be advanced therebetween, means for driving both of said feed belts at a higher speed than the speed at which said compression belt is driven, means for backing the lower reach of each of said upper belts comprising closely spaced spring pressed rollers, the springs for the rollers of said upper feed belt being placed under a smaller initial compression than the springs for the rollers of the upper compression belt thereby allowing said feed belts to slide over the surface of the carton as it is being received between said compression belts.

21. In a machine for sealing filled cartons including flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor including a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, and means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton, means for confining the sides of the car-

ton as it leaves the transfer conveyor and as it enters the compression apparatus, said means comprising a plurality of supports each carrying a yielding pressure-applying device, one pair of said supports being mounted on opposite sides of the carton in a plane near the top thereof, and another pair of said supports being mounted on opposite sides of the carton in a plane near the bottom thereof, and means for vertically adjusting said supports to bring said yielding pressure-applying devices opposite the hinges of said outer flaps.

22. In a machine for sealing filled cartons including flap gluing and closing apparatus, compression apparatus operating to maintain a pressure upon the closed flaps of a carton passing through the same and provided with conveying means for conveying cartons therethrough, a transfer conveyor for removing a carton from the flap gluing and closing apparatus and feeding it to the compression apparatus, said conveyor including a power driven transfer element operating to advance the cartons towards the compression apparatus at a greater speed than that of the conveying means for said apparatus, and means for maintaining the freshly glued outer flaps in contact with the inner flaps of the carton, means for confining the sides of the carton as it leaves the transfer conveyor and as it enters the compression apparatus, said means comprising a plurality of supports each carrying a yielding pressure-applying device, one pair of said supports being mounted on opposite sides of the carton in a plane near the top thereof, and another pair of said supports being mounted on opposite sides of the carton in a plane near the bottom thereof, and means for mounting said supports for lateral adjustment to accommodate cartons of different width.

23. In a transfer conveyor for machines for sealing filled cartons, a pair of endless belts mounted in vertically spaced relation to receive a carton therebetween, means for driving said belts at the same speed imparting tractive effort to the carton through the upper and lower flaps thereof simultaneously, a frame for supporting the lower belt and a carriage for supporting said upper belt, means for relatively adjusting said frame and carriage to accommodate cartons of different height, a pair of supports each carrying a yielding pressure-applying device adapted to engage the opposite sides of the carton near the bottom thereof, a second pair of supports carrying yielding pressure-applying devices adapted to engage the opposite sides of the carton near the top, means mounted on said frame for supporting said first pair of supports, means mounted on said carriage for supporting said second pair of supports to cause said yielding pressure-applying devices to be adjusted simultaneously with the vertical adjustment of said belts, and means for adjusting said supports relative to said frame and carriage to bring said yielding pressure-applying devices opposite the hinges of the upper and lower flaps.

24. In a transfer conveyor for machines for sealing filled cartons, a pair of endless belts mounted in vertically spaced relation to receive a carton therebetween, means for driving said belts at the same speed imparting tractive effort to the carton through the upper and lower flaps thereof simultaneously, a frame for supporting the lower belt and a carriage for supporting said upper belt, means for relatively adjusting said frame and carriage to accommodate cartons of different height, a pair of supports each carrying a yielding pressure-applying device adapted to engage the opposite sides of the carton near the bottom thereof, a second pair of supports carrying yielding pressure-applying devices adapted to engage the opposite sides of the carton near the top, brackets mounted on said frame for supporting said first pair of supports, and brackets mounted on said carriage for supporting said second pair of supports to cause said yielding pressure-applying devices to be adjusted simultaneously with the vertical adjustment of said belts.

25. In a transfer conveyor for machines for sealing filled cartons, a yielding pressure-applying device adapted to engage one side of the carton, a support for mounting said pressure-applying device in adjustable position, a second yielding pressure-applying device adapted to engage the opposite side of a carton, and a support for mounting said second pressure-applying device in adjustable position, each of said supports for said pressure-applying devices comprising a vertically adjustable bracket having a horizontal aperture therein, a tubular sleeve adjustably mounted in said aperture of each of said brackets, a rod projecting from each of said pressure-applying devices and passing through said sleeves, a helical spring on each of said rods between the pressure-applying devices and the adjacent ends of said sleeves, and adjustable stops coacting with the opposite ends of said sleeves for positioning the pressure-applying devices under the resilient action of said springs.

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