April 7, 1936. C. F. RICHARD 2,036,643

CARTON SEALING MACHINE

Filed March 12, 1934 2 Sheets-Sheet 1

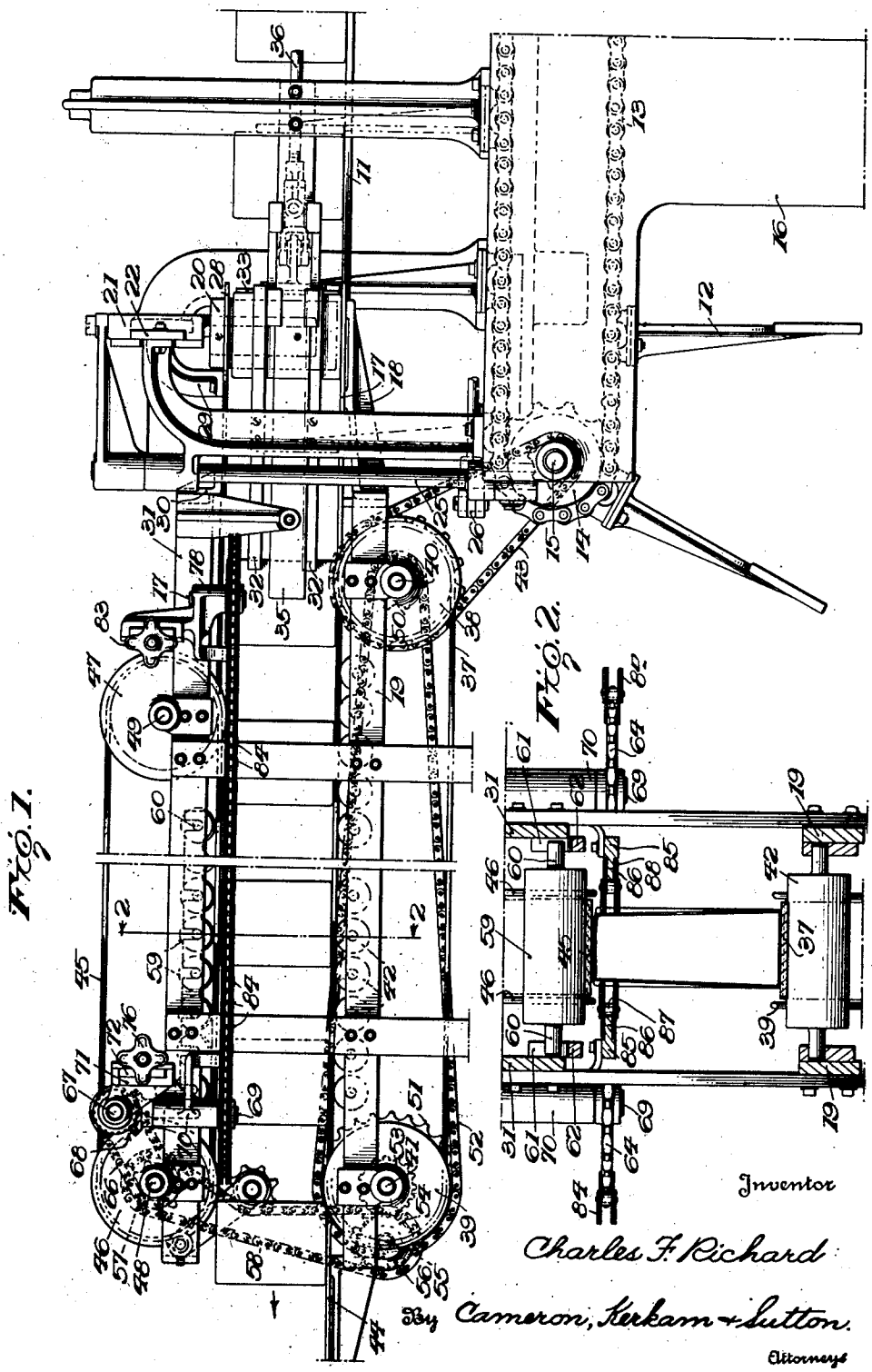


Fig. 1.

Fig. 2.

Inventor

Charles F. Richard

By Cameron, Kerkam & Sutton.

Attorneys

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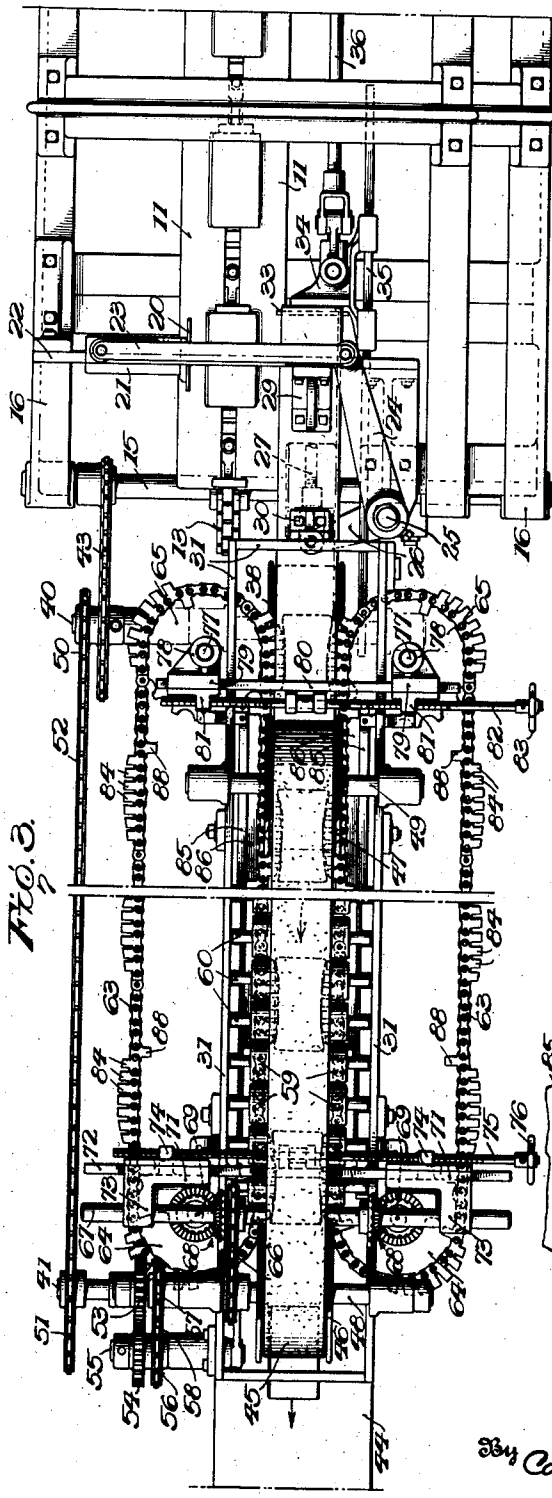


Fig. 3.

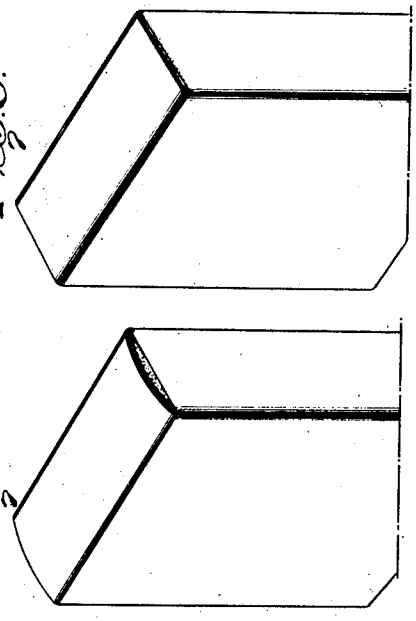


Fig. 6.

Fig. 5.

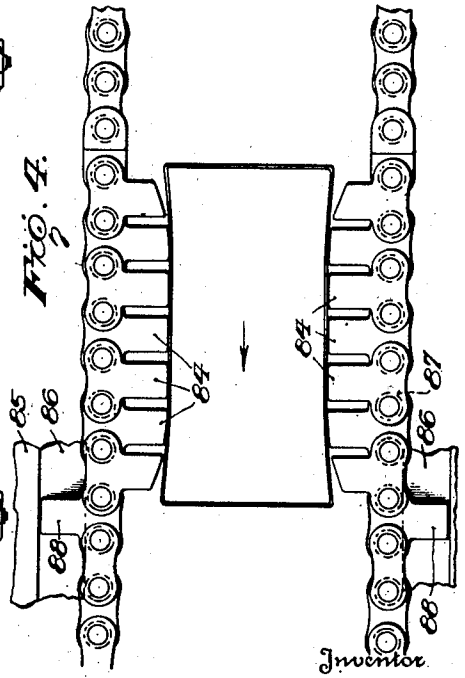


Fig. 4.

Inventor

Charles F. Richard.

By Cameron, Kerkam & Sutton

Attorneys

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UNITED STATES PATENT OFFICE

2,036,643

CARTON SEALING MACHINE

Charles F. Richard, Battle Creek, Mich., assignor to Johnson Automatic Sealer Co., Ltd., Battle Creek, Mich., a limited-partnership association of Michigan

Application March 12, 1934, Serial No. 715,235

15 Claims. (Cl. 93—6)

This invention relates to apparatus for sealing packages, and more particularly to machines for sealing the tops of filled cartons.

It is common practice in the sealing of cartons to apply glue or other suitable adhesive to the flaps forming the end closures of the cartons, then fold the flaps into overlapping relationship, and finally bring the closed ends into engagement with a suitable pressing device which exerts a sealing pressure against the flaps forcing them into adhesive contact with one another and presumably continuing until the adhesive has dried sufficiently to insure a tight, uniform seal. For example, in top sealing machines of the type now in general use, the sealing operation is commonly performed by first folding in the flaps secured to the front and rear panels of the carton, then adhesively coating the flaps secured to the side panels and folding the latter down on top of the already folded front and rear flaps, and finally moving the carton under a weighted belt or rollers which press the flaps downwardly to effect adhesive engagement and sealing thereof.

However, due to the fact that the edges of the carton are relatively stiff while the central portions of the flaps are unsupported, except in some instances by the contents of the carton, this form of sealing not only often fails to produce good and uniform adhesive engagement over the entire coated surfaces of the flaps but also frequently results in a forcing of the inner flaps downwardly into the body of the carton and into contact with the contents thereof, an undesirable result especially where the contents, such as food products, are enclosed in a separate liner or inner bag of relatively fragile material having an independent seal which it is desired to maintain unbroken.

It is therefore one of the objects of the present invention to provide a carton sealing apparatus of novel construction which is capable of not only producing a uniformly tight seal between the carton flaps but also maintaining all of the flaps in positions substantially in the plane of the carton panel edges to which they are secured.

Another object is to provide an improved carton sealing machine wherein the carton flaps are urged toward an outwardly convexed or arched position during the sealing operation so as to increase the effectiveness of the seal between the flaps and at the same time prevent the inner flaps from being forced inwardly into the body of the carton and against the contents thereof when the sealing pressure is applied.

A further object is to provide a carton sealing unit of novel yet simple structure that can be connected to the delivery end of a carton filling and closing machine and will automatically and efficiently complete the seal of the top of a filled and closed carton.

Still another object is to provide a new and improved mechanism for sealing the tops of cartons whereby there is secured a more extensive and tighter seal between the flaps than is attained with like devices hitherto known to the art.

These and other objects will appear more fully from a consideration of the detailed description of the embodiment of the invention that follows. Although there is described and illustrated in the accompanying drawings only one form of carton sealing machine embodying the present invention, it is to be expressly understood that these drawings are for the purpose of illustration only and are not to be construed as defining the scope of the invention, reference being had for this purpose to the appended claims.

Referring now to the drawings, wherein like reference characters indicate like parts throughout the several views:

Fig. 1 is a side elevation of a carton sealing mechanism constituting one embodiment of the present invention;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a plan view of the mechanism disclosed in Fig. 1;

Fig. 4 is a plan view on an enlarged scale of a portion of the endless chains upon which are mounted the carton engaging pressure members, and indicates the manner in which the carton sides are forced inwardly toward one another to produce the desired convexed arching of the carton flaps;

Fig. 5 is a perspective view of the top of a carton showing the convexly arched position of the flaps before application thereto of the sealing pressure; and

Fig. 6 is a perspective view similar to Fig. 5 showing the position of the carton flaps after the sealing pressure has been applied.

In the drawings the novel carton sealing apparatus of the present invention has been shown connected to the delivery end of a carton filling and closing machine of known construction, and will be described in connection with such a structure simply as an example of the manner in

which the preferred form of the invention may be utilized.

As shown, cartons that have been filled and have had their top flaps adhesively coated and folded inwardly to closed position may be advanced to the receiving end of the sealing mechanism forming the subject matter of the present invention along suitable ways 11 by conveyor means of any desired type such as pusher members 12 which are secured to an endless chain 13 and extend upwardly between ways 11 in position to engage the cartons. Chain 13 passes about a sprocket wheel 14 fixed on shaft 15, the latter being journalled in suitable bearings provided in supporting frame members 16 of the carton filling and closing machine. As the cartons approach the end of ways 11, they may be transferred laterally by any suitable mechanism onto a supporting plate or table 17 which is mounted in line with and forms an approach to the sealing mechanism. As shown, table 17 is supported by means of a suitable bracket 18 which is in turn connected to the lower horizontal frame members 19 of the sealing unit.

In the embodiment illustrated, the carton transfer means comprises a pusher member 20 suspended in a vertical position from a crosshead 21, the latter being adapted to reciprocate transversely of the path of travel of the cartons along a suitable guide member 22 mounted in a position well above the tops of the cartons. The reciprocation of crosshead 21 along guide 22 is accomplished by means of a connecting link 23, one end of which is secured to crosshead 21 and the other end to an arm 24 fixed to the upper end of a vertical shaft 25, the lower end of the latter carrying a second arm 26 to the outer end of which is connected a rod 27 which may be reciprocated by any suitable means (not shown) in timed relation with the movements of pusher members 12.

During the transfer of the cartons from ways 11 onto table 17, they pass beneath a plate 28 which is supported in any suitable manner, as by brackets 29 and 30 carried by guide member 22 and the upper horizontal frame members 31 of the carton sealing mechanism, respectively, in a position just above the folded carton flaps, said plate being provided for the purpose of preventing the adhesively coated flaps from coming open during the transfer from the delivery end of the carton filling and closing machine to the carton sealing mechanism.

Reciprocation of pusher member 20 delivers the cartons onto table 17 and beneath plate 28, as previously described, and into a position in line with a second transfer mechanism which is adapted to advance the cartons over table 17 into the sealing mechanism. As shown, pusher member 20 moves the cartons off of ways 11 and over table 17 until they come to rest up against a pair of guide rails 32, in which position they are directly in front of a second pusher member 33 which is adapted to be reciprocated in a direction perpendicular to the direction of movement of pusher member 20 and to deliver the cartons onto the conveyor of the sealing mechanism. Pusher member 33 may be mounted on a crosshead 34 which is reciprocable along a suitable guide member 35 by means of a connecting rod 36, the movements of the latter being timed in relation to the movements of transfer pusher member 20 and conveyor pusher members 12 by any suitable mechanism (not shown), similarly to the manner in which connecting rod 27 is operated.

By means of the apparatus thus far described, filled and closed cartons may be transferred from the delivery end of any suitable filling and closing machine into a position in line with the receiving end of the sealing mechanism of the present invention, and then advanced into said mechanism for completion of the sealing operation by the means next to be described.

The novel sealing mechanism provided by the present invention essentially comprises a pressing means adapted to exert a sealing pressure on the folded and adhesively coated carton flaps, a conveyor means for carrying the cartons into engagement with the pressing means, and a means for producing or tending to produce a convexed arching of the flaps toward the pressing means so as to both increase the effectiveness of the sealing pressure exerted by the latter and prevent the forcing of the flaps inwardly into the bodies of the cartons.

In the embodiment illustrated, the conveyor means to which the cartons are delivered by pusher member 33 may comprise an endless belt 37 of any suitable construction which passes over drums 38 and 39 mounted on shafts 40 and 41, respectively, the latter being journalled in suitable bearings carried by the lower frame members 19 of the sealing mechanism, the upper reach of belt 37 traveling over a plurality of supporting rollers 42 which may be journalled in suitable bearings also fixed with respect to frame members 19. Belt 37 is of such length and is adapted to be continuously driven in any suitable manner at such a speed that the time required for conveying a carton through the sealing mechanism is adequate for the completion of a tight, uniform seal between the adhesively coated flaps. As shown, shaft 40 upon which drum 38 is fixedly mounted is continuously rotated by a chain drive 43 from any suitable source, drum 39 turning freely on shaft 41 with the movement of belt 37. In installations where the conveyor chain 13 of the carton filling and closing machine is continuously driven, chain drive 43 may take its power from shaft 15, as shown in the drawings.

As shown best in Fig. 1, carton supporting table 17 terminates closely adjacent the point where belt 37 passes over the top of drum 38 so that cartons may be smoothly and easily delivered to belt 37 by pusher member 33 and thereafter moved through the sealing mechanism on belt 37 which, supported by rollers 42, provides a substantially unyielding conveyor-support for the cartons during the sealing operation. As belt 37 passes around drum 39 at the end of its run, the sealed cartons pass onto a supporting plate or table 44 of any suitable construction whence they may be removed either manually or mechanically in any desired manner.

In order that a proper sealing pressure may be applied to the closed and adhesively coated carton flaps while the cartons are moved through the sealing mechanism on belt 37, the present embodiment of the invention is provided with an endless belt 45 which is mounted directly above the path of travel of the carton tops, is adapted to be driven in synchronism with conveyor belt 37 so as to move with the cartons, and is provided with suitable means for forcing the lower reach thereof downwardly into pressure contact with the carton flaps. As shown, belt 45 passes around drums 46 and 47 mounted in shafts 48 and 49, respectively, the latter being journalled in suitable bearings carried by upper frame mem-

bers 31 of the sealing structure. Shaft 48, to which drum 46 is fixedly secured, is driven in any suitable manner at such a speed that belt 45 moves at the same linear speed as conveyor belt 37 and the cartons supported thereon. In the embodiment illustrated, the drive for shaft 48 comprises a sprocket 50 fixed to and rotating with shaft 40, a sprocket 51 fixed to shaft 41, a chain 52 forming a driving connection between sprockets 50 and 51, a gear 53 also fixed to shaft 41, a complementary gear 54 meshing with gear 53 and mounted on a stub shaft 55, a sprocket 56 also mounted on shaft 55 and preferably formed integrally with gear 54, a sprocket 57 secured to shaft 48, and a chain 58 forming a driving connection between sprockets 56 and 57.

It is to be noted that, while drum 47 is mounted substantially directly above drum 39, sealing belt 45 is shorter than conveyor belt 37 and does not engage the carton flaps until some time after the cartons are delivered onto conveyor belt 37, the purpose of which construction is later to be explained.

The means for applying the downward sealing pressure to belt 45 may be of any suitable construction, but in the present instance comprises a plurality of floating pressure rollers 59 which rest upon the upper surface of the lower reach of belt 45 and are capable of a limited vertical movement of their axes of rotation so as to exert a sealing pressure that is yieldable. As shown, each of rollers 59 is wider than belt 45, the latter in turn being wider than the cartons so that a uniform sealing pressure is applied over the entire surface of the carton flaps, and is provided at each end with a trunnion 60 which is journalled in a vertical slot 61 formed in a longitudinally extending bearing rack 62 which may be suitably secured to upper frame member 31. As shown best in Fig. 2, the bottoms of slots 61 positively limit the lowermost positions of pressure rollers 59, and hence by adjusting the vertical positions of bearing racks 62 the sealing mechanism may be adapted for handling cartons of varying heights.

With this construction, cartons being carried through the sealing machine on conveyor belt 37 will pass under sealing belt 45 and their top flaps will be engaged by said belt under a yielding sealing pressure exerted by rollers 59, belt 45 moving with the cartons and thereby insuring that the flaps will not be pulled from their proper positions before the adhesive sets due to friction between said flaps and the pressure applying surface. It will be noted that flap retaining plate 28 extends to and terminates closely adjacent the point where the lower reach of belt 45 leaves the periphery of drum 47, thereby insuring that the closed and glued flaps remain in their proper overlapping relation until engaged by belt 45.

While the mechanism thus far described is capable of sealing the cartons as they are moved through the machine on conveyor belt 37, the character of the seal obtainable is not uniformly satisfactory. For example, since the edges of the carton are relatively stiff while the central portions of the flaps are unsupported, the sealing pressure is not uniformly effective over the entire coated surfaces of the flaps and often results in poor adhesive engagement between the flaps particularly at the central portions thereof. Also, the inner flaps of the carton closures are frequently forced downwardly by the application of the sealing pressure into the bodies of the cartons and into contact with the contents thereof, a condition that is especially to be avoided where the contents are enclosed in an inner liner or bag of relatively fragile material having an independent seal which it is desired to maintain unbroken. In order to remedy these faults of known sealing mechanisms, and to provide an apparatus which is capable of producing a uniformly tight and highly efficient seal, novel means have been provided by the present invention for applying pressure to the sides of the cartons in such a manner as to urge the carton flaps toward a convexly arched position during the travel of the cartons through the sealing unit.

In the embodiment shown, suitable means are provided on each side of the path of travel of the cartons through the sealing mechanism for exerting an inward pressure against the opposite carton sides at points just below the top edges thereof to which the closure flaps are secured, this inward pressure causing or tending to cause an upward arching of the flaps toward the sealing belt. As illustrated in the drawings, the flap arching means may comprise a pair of endless carrier chains 63, one on each side of the path of travel of the cartons, each of which passes around a pair of sprockets 64 and 65 which may be driven in any suitable manner such that chains 63 move in synchronism with conveyor belt 37 and the cartons carried thereby. Both of carrier chains 63 lie and move in a horizontal plane that is spaced just below the plane of the upper edges of the cartons, and they are of substantially the same length as conveyor belt 37 so as to extend a desired distance beyond sealing belt 45 at the receiving end of the sealing mechanism, whereby the flap arching pressure may be applied to the cartons prior to the time that they pass beneath belt 45.

Carrier chains 63 may be driven from any suitable source, the drive in the embodiment illustrated being taken from shaft 48 through a chain drive 66 to a transverse shaft 67 mounted above upper frame members 31 and journalled in suitable bearings carried by mechanism next to be described, and from shaft 67 through bevel gears 68 to a pair of vertical stub shafts 69 to the lower ends of which sprockets 64 are secured. Each of stub shafts 69 is journalled in a bearing member 70 which is secured to, and preferably formed integrally with, a crosshead 71 which slidably engages a guide bar 72 mounted on and transversely to upper frame members 31. Each of crossheads 71 is provided with a projection 73 in which is formed a bearing for transverse shaft 67, and also with an internally threaded projection 74 through which passes a screw shaft 75, the end portions of the latter being threaded in opposite directions and one end being fitted with an adjusting hand wheel 76. In a similar manner, each of sprockets 65 is secured to a vertical stub shaft 77 which is journalled in a bearing member 78, the latter being formed integrally with a crosshead 79 which is in turn slidably mounted on a guide bar 80 mounted on and above frame members 31. Like crossheads 71, crossheads 79 are provided with internally threaded projections 81 through which passes a screw shaft 82 having oppositely threaded end portions, the latter also being provided with an adjusting hand wheel 83.

With this construction, the horizontal distance between each pair of vertical stub shafts 69 and 77 may be readily adjusted so as to vary the distance between the adjacent reaches of carrier chains 63 and thus accommodate the mechanism to cartons of varying widths, or adjust

the degree of pressure exerted against the carton sides by the members next to be described.

In order to provide a pressure against the carton sides sufficient to produce an arching of the carton flaps and to prevent the forcing of the inner flaps downwardly into the cartons, each of carrier chains **63** is provided with suitable pressure members which are adapted to engage the carton sides just below the upper edges thereof and to exert a predeterminable pressure thereagainst. As shown best in Figs. 3 and 4, each carrier chain is provided at spaced intervals therealong with a plurality of groups of links having laterally extending, knife-like pressure fingers **84** which project outwardly from the links in a horizontal plane and are adapted to engage the carton sides at their outer edges. If desired, each of the links so provided may have a pair of such fingers **84** vertically spaced by the thickness of the link. The fingers carried by the links adjacent the extremities of each group are preferably shorter than those of the links in the center of each group and their inner edges are curved along suitable arcuate lines so that the initial engagement between said fingers and the carton sides as the links pass around sprockets **65** will be gradual and such as to avoid puncturing the cartons. Each group of pressure fingers is preferably of slightly less extent than the width of the carton panel to be engaged thereby.

In order that pressure fingers **84** may exert a positive and predeterminable pressure against the carton sides, suitable guides **85** may be provided to engage the outer surfaces of the adjacent inner reaches of chains **63** and constrain the latter to travel in a definite path both horizontally and vertically. In the present embodiment, guide rails **85** are adapted to be supported in any suitable manner by crossheads **71** and **79** in the horizontal plane in which it is desired that pressure fingers **84** engage with the carton sides, and are each provided with a relatively thin, horizontally projecting portion **86**. The inner vertical surfaces of portions **86** provide guiding surfaces for the sleeves **87** with which each of the link connecting pins is provided, thereby positively limiting the movement of opposing pressure fingers **84** away from one another which would decrease the pressure applied to the carton sides, while the upper and lower horizontal surfaces of said portions are embraced by guiding fingers or lugs **88** which are carried by certain of the links of chains **63** and project horizontally therefrom in a direction opposite to pressure fingers **84**, thereby effectively preventing chains **63** from sagging out of the horizontal plane in which it is desired that engagement be made between pressure fingers **84** and the carton sides. In the form shown, the link adjacent one end of each of the groups of pressure fingers **84** is provided with guiding fingers **88**. It will be understood that, where carrier chains **63** are sufficiently taut to both prevent sagging and maintain the desired pressure against the carton sides, guide rails **85** may be omitted.

In operation, after the closed and filled cartons have been delivered onto conveyor belt **37** by pusher member **33**, the adhesively coated top flaps of the cartons being maintained in their proper folded positions by plate **28**, the cartons are advanced by belt **37** between carrier chains **63** as the latter come around sprockets **65** and are engaged at points just below the top edges thereof under a predetermined pressure by knife-like fingers **84**. This inward pressure bows in the side panels of the cartons, as indicated in Fig. 4, and causes a convexed arching of the top flaps, as indicated in Fig. 5. It will be understood that the several groups of pressure fingers **84** are so spaced on chains **63**, and the latter are so synchronized with the movement of conveyor belt **37**, that each carton is properly engaged by opposite groups of fingers **84**. With the top flaps thus arched, and prevented from coming open by plate **28**, the cartons continue their advance until they pass beneath and are engaged by the lower reach of sealing belt **45**. As movement of the cartons continues (belt **45**, as well as chains **63** and belt **37**, now moving together with the cartons), the sealing pressure is yieldingly applied to the flaps by rollers **59**, said pressure tending to flatten out the arch imparted to the flaps by the inward pressure of fingers **84** so as to distribute the sealing pressure evenly over the entire coated surfaces of the flaps. Since this inward pressure of fingers **84** continues throughout the travel of the cartons beneath belt **45**, the tendency of the flaps to become arched continues and increases the effectiveness of the sealing pressure, while at the same time the inward bowing of the carton side panels effectively prevents the inner flaps of the carton closures from being forced downwardly into the bodies of the cartons.

There is provided by the present invention a carton sealing apparatus of novel construction which is capable of producing a more efficient and uniform seal of the carton flaps than is attainable by any of the devices now on the market, and which also insures that the contents of the cartons will not be disturbed by the inward forcing of any of the carton flaps. In providing a new and improved device of this character, novel means have been developed which, by the exertion of pressure against the carton side panels, first produce and then continue to tend to produce a convexed arching of the carton flaps which materially increases the effectiveness of the sealing pressure applied thereto and at the same time maintains said flaps in positions substantially in the plane of the carton panel edges to which they are secured. The invention also includes the provision of mechanism of novel construction for producing the desired pressure against the sides of the cartons and for adjusting and limiting said pressure to predetermined values.

It will be obvious that the invention is not limited to the apparatus shown in the drawings, but is capable of a variety of mechanical embodiments. For example, any suitable form of conveyor may be utilized in place of the endless belt and supporting rollers shown, while the flap sealing belt and associated mechanism may likewise be replaced by other suitable forms of pressure applying devices. Furthermore, the means for applying the flap arching pressure to the cartons is not limited to the specific chain construction disclosed, but may be replaced by any suitable mechanism that is capable of functioning in substantially the same manner for the attainment of the desired result. Moreover, although the sealing mechanism of the present invention has been described in combination with a carbon filling and closing machine and transfer mechanism of a particular type, it is evident that the sealing unit is equally well adapted for use with other forms of carton handling devices, or as a separate and independent machine. It is also obvious that, although the

specific sealing mechanism disclosed is adapted for the sealing of the top flaps of a filled carton, the underlying concept of the present invention is equally susceptible of embodiment in a machine for forming the bottom closures of cartons.

Various other changes, which will now appear to those skilled in the art, may be made in the form, details of construction and arrangement of the parts without departing from the spirit of the invention. Reference is therefore to be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, a pair of endless carriers arranged on opposite sides of the path of travel of said cartons and moving in synchronism with said cartons, and inwardly extending pressure members carried by each of said carriers adapted to exert a pressure against the sides of the cartons tending to convexly arch said flaps during the carriage of said cartons by said conveyor means.

2. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, carrier members arranged on opposite sides of the path of travel of said cartons and moving in synchronism with said cartons, and means carried by said carrier members for exerting an inward pressure against the sides of the cartons in a plane slightly spaced from the plane of said flaps.

3. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, a pair of endless carriers arranged on opposite sides of the path of travel of said cartons and moving in synchronism with said cartons, and inwardly extending pressure members carried by each of said carriers adapted to exert a pressure against the sides of the cartons in a plane slightly spaced from the plane of the edges of the cartons to which said flaps are secured, said inward pressure tending to convexly arch said flaps in a direction opposite to that in which the sealing pressure is applied by said pressing means.

4. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, a pair of endless chains arranged on opposite sides of said conveyor and moving in synchronism with said cartons, and a plurality of knife-like members carried by said chains and so arranged as to exert an inward pressure against the sides of said cartons at points slightly spaced from the plane of said flaps.

5. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, a pair of endless chains arranged on opposite sides of said conveyor in a plane slightly spaced from the plane of said flaps and moving in synchronism with said cartons, and a plurality of inwardly extending pressure members carried by said chains and so arranged as to exert an inward pressure against the sides of said cartons at points closely adjacent the end edges of said sides.

6. In a machine for sealing the closed and adhesively coated flaps of cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons into engagement with said pressing means, carriers arranged on opposite sides of said conveyor and moving in synchronism with said cartons and a plurality of pressure members carried by said carriers and so arranged as to exert an inward pressure against the sides of said cartons, said carriers being of such extent that said pressure members engage the carton sides before said flaps come into engagement with said pressing means, the inward pressure exerted by said members convexly arching said flaps and thereby increasing the effectiveness of the sealing pressure exerted by the pressing means and preventing the forcing of the flaps inwardly into the bodies of the cartons.

7. In a machine for sealing the top flaps of a filled and closed carton, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the carton beneath said pressing means, and means traveling with said carton during the sealing operation for exerting an inward pressure against opposite sides of said carton at points just below the top edges thereof, said inward pressure tending to convexly arch said flaps upwardly thereby increasing the effectiveness of the sealing pressure exerted by said pressing means and preventing the forcing of the flaps downwardly into the body of the carton.

8. In a machine for sealing the top flaps of a filled and closed carton, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the carton beneath said pressing means, a pair of carriers arranged on opposite sides of the path of travel of said carton and moving in synchronism therewith during the sealing operation, and means carried by said carriers for exerting an inward pressure against the sides of said carton in a horizontal plane just below the top edges thereof, said pressure being sufficient to produce an upward convexed arching of said flaps when unopposed by said sealing pressure.

9. In a machine for sealing the top flaps of filled and closed cartons, pressing means for exerting a sealing pressure on said flaps comprising an endless belt adapted to move with the cartons during the sealing operation and means for forcing said belt downwardly into pressure contact with said flaps, conveyor means for carrying the cartons beneath said belt, a pair of endless carriers arranged on opposite sides of the path of travel of the cartons and moving in synchronism therewith, said carriers being longer than said belt and paralleling the path of travel of said cartons both before and during the time that said flaps are engaged by said pressing means, and means carried by said carriers for exerting an inward pressure against the sides of said cartons in a horizontal plane just below the top edges thereof, said pressure being sufficient to produce an upward convexed arching of said flaps when unopposed by said sealing pressure.

10. In a machine for sealing the top flaps of filled and closed cartons, pressing means for exerting a sealing pressure on said flaps comprising

an endless belt adapted to move with the cartons during the sealing operation and means for forcing said belt downwardly into pressure contact with said flaps, conveyor means for carrying the cartons beneath said belt, a pair of endless chains arranged on opposite sides of the path of travel of said cartons and moving in synchronism therewith in a horizontal plane just below the plane of said belt, and members carried by said chains adapted to exert an inward pressure against the sides of the cartons tending to convexly arch said flaps upwardly in opposition to the sealing pressure exerted by said pressing means.

11. In a machine for sealing the top flaps of filled and closed cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons beneath said pressing means, a pair of carriers arranged on opposite sides of the path of travel of said cartons and moving in synchronism therewith in a horizontal plane just below the top edges of the cartons, and a plurality of knife-like members carried by each of said carriers adapted to engage the sides of said cartons, the adjacent edges of corresponding members on the two carriers when in carton-engaging position being spaced apart by a distance slightly less than the normal distance between the carton sides, thereby producing an inward pressure tending to convexly arch the carton flaps upwardly during carriage of said cartons by said conveyor means.

12. In a machine for sealing the top flaps of filled and closed cartons, pressing means for exerting a sealing pressure on said flaps comprising an endless belt adapted to move with the cartons during the sealing operation and means for forcing said belt downwardly into pressure contact with said flaps, conveyor means for carrying the cartons beneath said belt, a pair of endless chains arranged on opposite sides of the path of travel of said cartons and moving in synchronism therewith in a horizontal plane just below the plane of said belt, and a plurality of knife-like members carried by each of said chains adapted to engage the sides of said cartons, the adjacent edges of corresponding members on the two chains when in carton-engaging position being spaced apart by a distance slightly less than the normal distance between the carton sides, and said chains being of such length that said knife-like members engage the sides of the cartons both before and during the passage of the latter under said pressing means.

13. In a machine for sealing the top flaps of filled and closed cartons, pressing means for exerting a sealing pressure on said flaps, conveyor means for carrying the cartons beneath said pressing means, a pair of endless chains arranged on opposite sides of the path of travel of said cartons and moving in synchronism therewith in a horizontal plane just below the plane of the top edges of said cartons, a plurality of knife-like members carried by each of said chains adapted to engage the sides of said cartons, the adjacent edges of corresponding members on the two chains when in carton-engaging position being spaced apart by a distance slightly less than the normal distance between the carton sides, and means for varying the distance between said chains to accommodate cartons of different sizes.

14. In a machine for sealing the closed and adhesively coated flaps of moving cartons, means for exerting against the sides of the cartons an inward pressure tending to convexly arch the carton flaps during the sealing operation comprising a pair of endless carriers positioned on opposite sides of the path of travel of the cartons and having at spaced intervals therealong a plurality of groups of pressure fingers extending therefrom in position to engage the carton sides with a predeterminable pressure.

15. In a machine for sealing the closed and adhesively coated flaps of moving cartons, means for exerting against the sides of the cartons an inward pressure tending to convexly arch the carton flaps during the sealing operation comprising a pair of endless carriers positioned on opposite sides of the path of travel of the cartons and having at spaced intervals therealong a plurality of groups of pressure fingers extending therefrom in position to engage the carton sides, and guide means associated with said carriers for constraining the latter to move in predetermined paths and thereby regulating the pressure exerted against said carton sides.

CHARLES F. RICHARD.