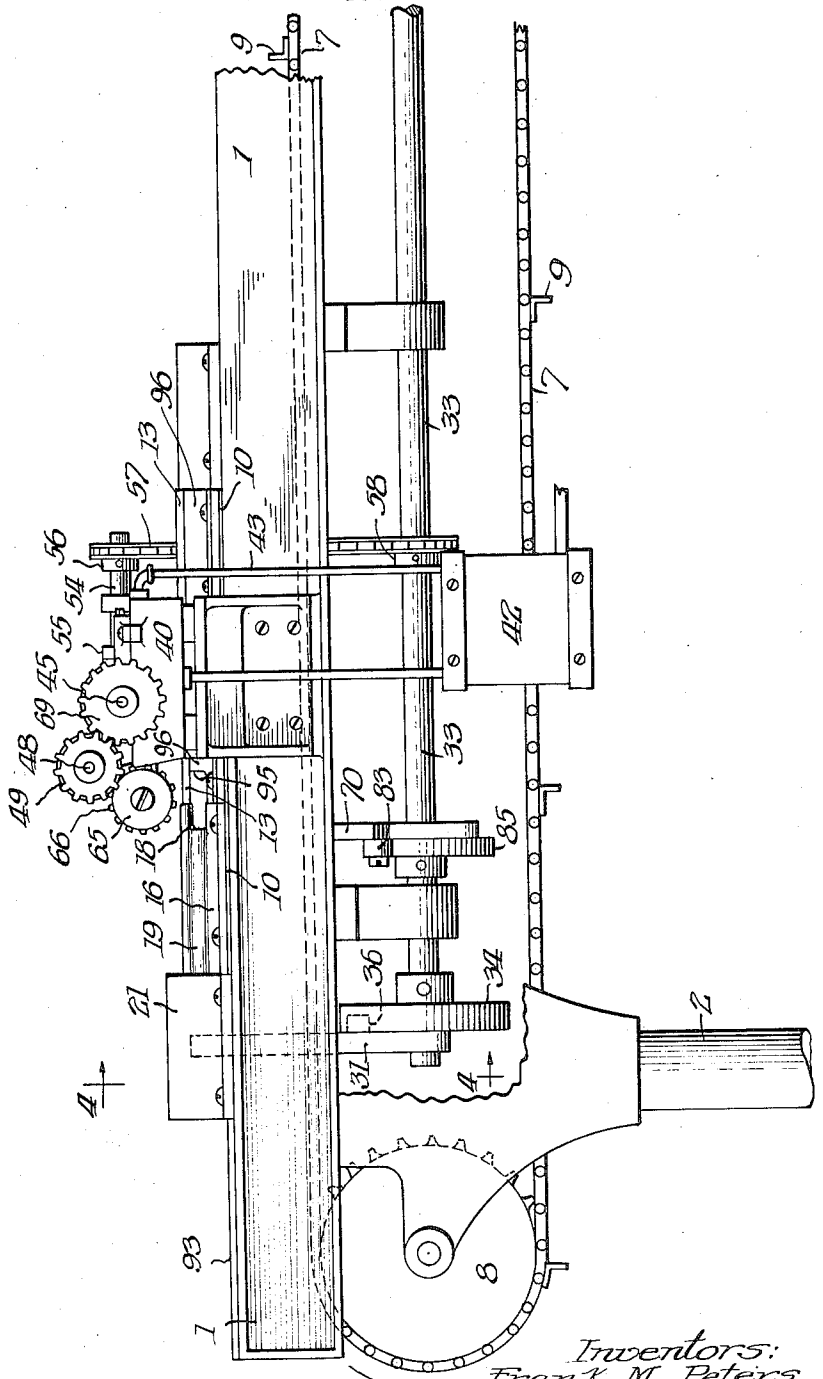
Dec. 25, 1923. 1,478,836

F. M. PETERS ET AL

CARTON SEALING APPARATUS

Filed Dec. 16, 1920 5 Sheets-Sheet 1

Fig. 1



Inventors:
Frank M Peters,
Warren H. Hungerford,
By Fisher, Dowl, Clapp & Evans
Attys.

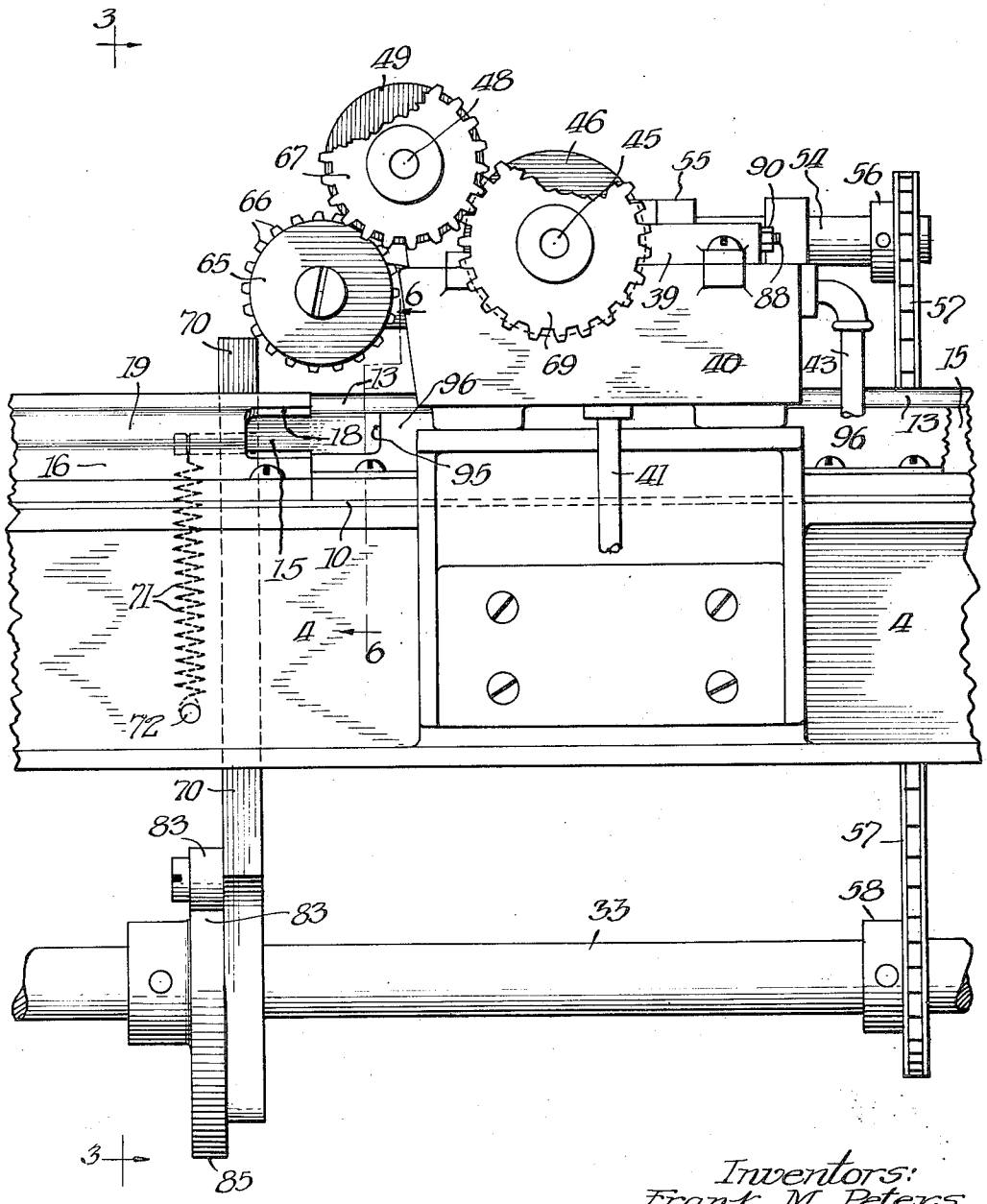
Dec. 25, 1923. 1,478,836

F. M. PETERS ET AL

CARTON SEALING APPARATUS

Filed Dec. 16, 1920 5 Sheets-Sheet 2

Fig. 2



Inventors:
Frank M. Peters,
Warren H. Hungerford,
By Fisher, Fowle, Clapp & Soans
Attys.

Dec. 25, 1923. 1,478,836

F. M. PETERS ET AL.

CARTON SEALING APPARATUS

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Fig. 3

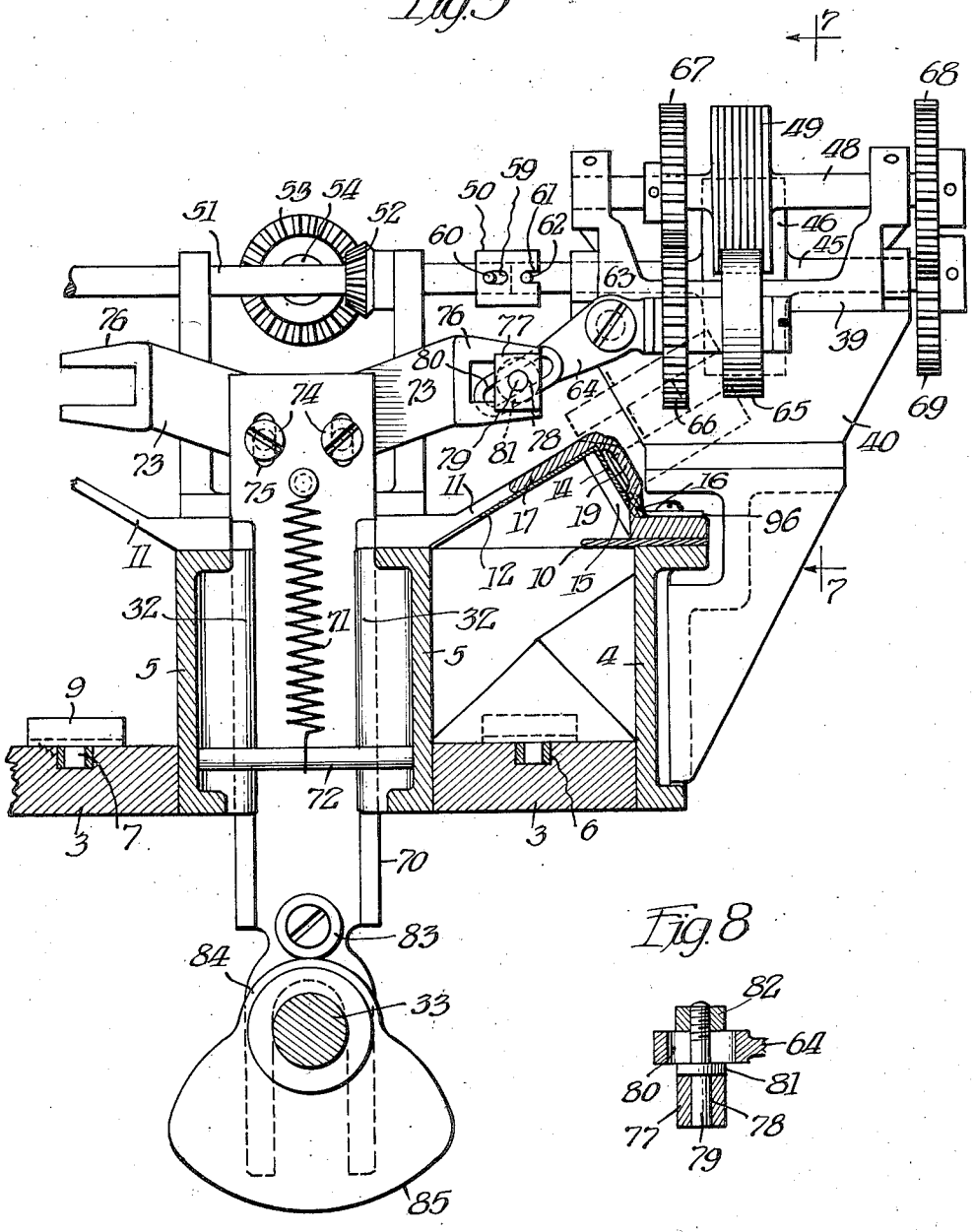


Fig. 8

Inventors:
Frank M. Peters
Warren H. Hungerford,
By Fisher, Fowle, Clapp & Soans
Attys.

Dec. 25, 1923. 1,478,836

F. M. PETERS ET AL

CARTON SEALING APPARATUS

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Fig. 4

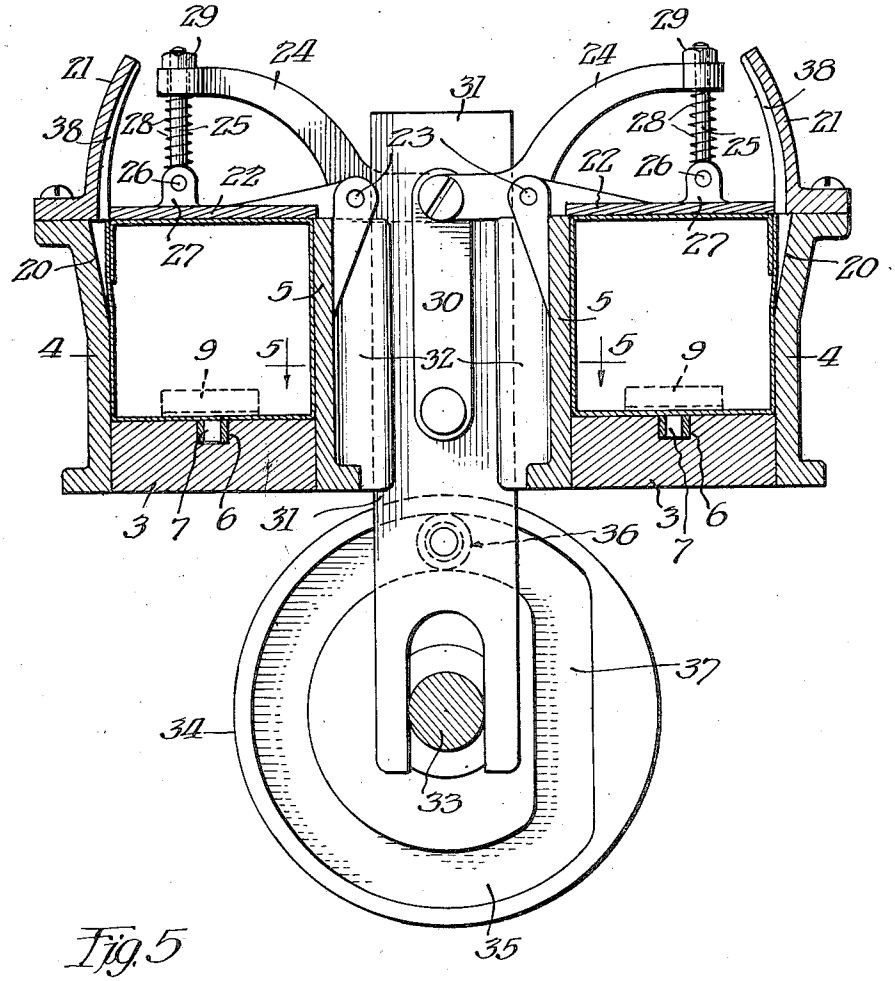
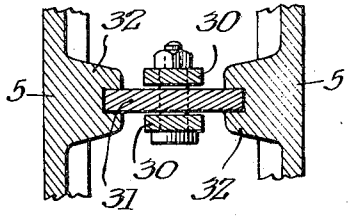


Fig. 5



Inventors:
Frank M. Peters,
Warren H. Hungerford,
By Fisher, Towle, Clapp & Sears
Attys.

Dec. 25, 1923. 1,478,836

F. M. PETERS ET AL

CARTON SEALING APPARATUS

Filed Dec. 16, 1920 5 Sheets-Sheet 5

Fig. 6

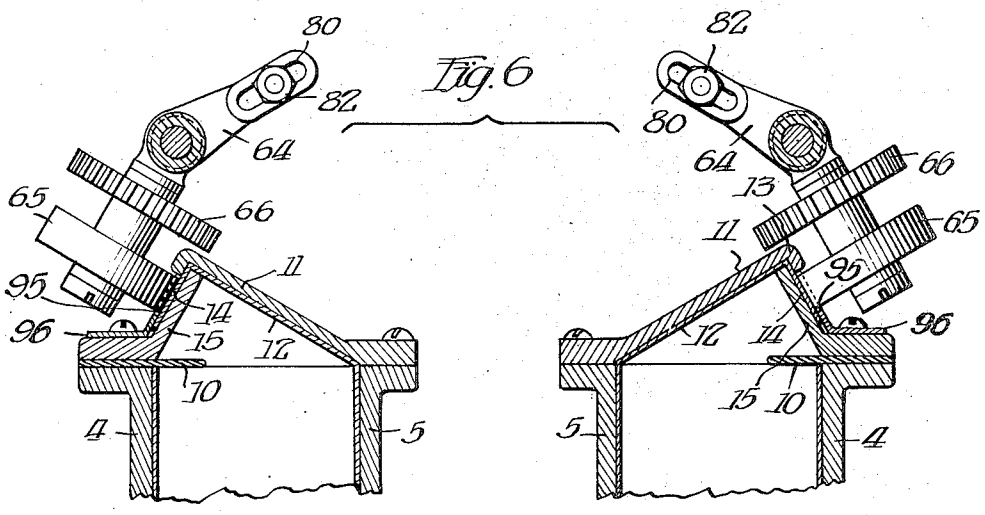
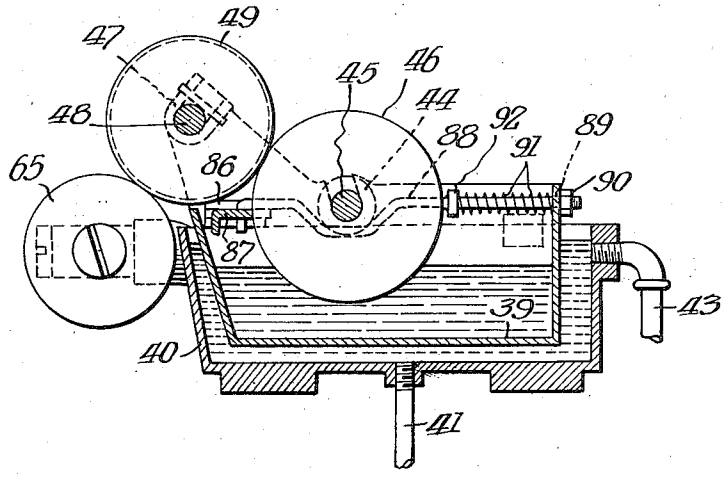


Fig. 7



Inventors:
Frank M. Peters,
Warren H. Hungerford,
By Fisher, Fowle, Clapp & Soans.
attys.

Patented Dec. 25, 1923. 1,478,836

UNITED STATES PATENT OFFICE.

FRANK M. PETERS AND WARREN H. HUNGERFORD, OF CHICAGO, ILLINOIS, ASSIGNORS TO PETERS MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CARTON-SEALING APPARATUS.

Application filed December 16, 1920. Serial No. 431,084.

To all whom it may concern:

Be it known that we, FRANK M. PETERS, and WARREN H. HUNGERFORD, both citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carton-Sealing Apparatus, of which the following is a specification.

Our invention has reference to the closing and sealing of cartons after they have been filled, by applying a coating of adhesive or paste to a flap which is tucked inside the carton, and thereby caused to adhere to an adjacent wall, for the purpose of sealing the carton.

The sealing apparatus which we have shown and described herein is particularly adapted for use in connection with carton folding and tucking machine, such as shown in Letters Patent No. 860,764, issued to us July 27, 1907, and we have illustrated herein only sufficient parts of said carton machine, so that the application of our present invention thereto may be readily understood. It is to be understood, however, that we do not limit our invention to the particular carton folding and tucking machine illustrated herein, as we contemplate using it in connection with any other machines to which it is capable of being applied.

The purpose of our invention is to permanently close a carton, after it is filled, in such a manner so that it is unnecessary to use a wrapper such as it is customary to employ for holding the package closed.

The principal objects of our invention are to provide a carton with an improved fastening for holding the cover closed; to seal a carton, after it has been filled, in a simple, economical and effective manner; to lock the carton cover in the closed position by securing a flap on the edge of the cover to the inside of a wall of the carton; to provide an apparatus for connecting a tucked-in cover flap to the wall of the carton so as to hold the carton closed; to apply a coating of paste or other adhesive to a flap which is subsequently tucked inside the carton against the inner side of the walls thereof; to apply the adhesive during the operations of folding and closing the carton; to avoid accumulation of the paste or adhesive on the mechanism or parts which serve to effect the folding and tucking of the carton flaps; to effect a uniform application of paste or adhesive to the carton flap; to provide a simple and inexpensive mechanism which may be employed as an attachment for a carton folding and tucking machine to seal a flap of the carton to a wall thereof and thereby securely close the carton; and in general to effect the final sealing of a carton without the use of a wrapper or separate seal, and at the same time afford a neat and acceptable appearance to the finished package.

On the drawings—

Fig. 1 is a side view of the discharge end of a carton folding and tucking machine, having our invention applied thereto;

Fig. 2, an enlarged side view of the mechanism for applying paste to the carton flap;

Fig. 3, a sectional view on the line 3—3 of Fig. 2;

Fig. 4, a sectional view on the line 4—4 of Fig. 1;

Fig. 5, a sectional view on the line 5—5 of Fig. 4.

Fig. 6, a fragmentary view on the line 6—6 of Fig. 2;

Fig. 7, a sectional view of the paste receptacle on the line 7—7 of Fig. 3; and

Fig. 8, a detail view, partly in section, of the connection for operating the paste roll.

Referring to the drawings—

The reference numeral 1 indicates the main frame of the machine, which is supported on standards 2, and comprises a pair of guide chutes extending in parallel, spaced relation lengthwise of the machine, each of these chutes being composed of bottom plates 3 and plates 4 and 5 extending upwardly at each side of the bottom plate 3 so as to form a channel through which the cartons slide. While two guide chutes are shown in the machine, it is to be understood that this is merely a convenient and practical form in which to construct the machine and that one or more chutes may be employed, as desired, without in any wise af-

fecting the invention. Each of the bottom plates 3 has a groove 6 in the upper surface in which the upper length of an endless chain 7 travels, these chains being carried by sprockets 8 at each end of the machine and operated in any suitable manner to propel the cartons through the guide chutes, flights 9 being provided on the chains at properly spaced intervals, which project upwardly in the carton chute and engage the rear ends of the packages, to insure movement of the packages in the chute.

The receiving end of the carton folding machine and the devices for folding down the end flaps and forming the cover flap preparatory to tucking in, are not shown, nor is the mechanism for operating the sprockets 8, as these parts of the machine may be the same as shown in the Peters and Hungerford Patent No. 860,764, hereinbefore referred to, and our invention merely requires that the carton should be advanced to the cover guides and paste-applying mechanism in a form in which the cover is ready to be closed down and the edge flap thereof inserted inside the carton, this being the condition of the carton shown in Fig. 6. By referring to said figure, it will be observed that the side wall 4 of the carton guide chute has a guard plate 10 projecting inwardly along the upper edge so as to overlie the top of the cartons and their contents as they are removed along the chute, and this plate serves to hold the previously folded end flaps of the carton down against the top of the carton contents. Another plate 15 is also secured to and extends along the upper edge of the side wall 4, so as to engage the outer edge of the carton cover 12, and hold same in a partially upraised position with the cover flap 14 resting against the outer face of the plate 15, and a companion plate 96, which is likewise secured along the top of the side wall 4 extends upwardly along the outer surface of the plate 15 and is spaced sufficiently therefrom to receive the cover flap 14 therebetween. An angular plate 11 which is secured to the upper edge of the other side wall 5 of the carton chute, serves to hold the carton covers 12 down in a partially closed position with the outer edge thereof engaged against the upper edge of the plate 15, and this plate 11 has a downturned flange 13 along the outer edge which extends downwardly a short distance along the outer surface of the plate 15 so as to hold the cover flap 14 against the outer face of the plate 15, as the carton is carried along the chute.

Beyond the plates 11, 15 and 96, is an angular plate 16 which is secured to the upper edge of the wall 4 and butts against the ends of the plates 11, 15 and 96, so that the carton cover passes from under the plates 11 and 96 without change in position or form, being drawn directly under the plate 16, which latter has a top flange 17 in the same plane as the plate 11 and overlying the outer portion of the cover 12. The upright portion of the plate 16 extends over the cover flap 14 of the carton and is transversely arched throughout its length, as indicated at 19 so that the intermediate portion of the carton flap 14, to which paste is applied, does not pass in contact with the under surface of the plate 16. The paste is applied to the flap 14 just before the latter passes under the plate 16, and to admit the paste roll into contact with the flap 14, the plate 16 is cut away at its forward end as indicated at 18 and the plate 96 correspondingly cut away at 95 to expose the upper surface of the flap 14 at this point, and the upstanding portion of the plate 15 is continued under the cut away portions of the plates 16 and 96 to support the cover flap as the paste roll is applied thereto.

Immediately beyond the plate 16 the side wall 4 is flared outwardly, as indicated at 20, and has an arcuate flange 21 extending upwardly therefrom, and there is a plate 22 pivoted at 23 to the chute wall 5, and normally held at an angular position with the outer edge adjacent the outer edge of the flange 21, so that, as the carton is advanced along the guide chute, the partially closed cover 12 and cover flap 14 will pass out from under the flanges of the angular plate 16, under the plate 22, and at the inner side of the flange 21 in substantially the same relative position which they occupy under the plate 16. Mounted on the pivot 23, of each plate 22, is a lever 24 which has one arm arched over the top of the plate 22 and connected therewith by a stem 25 which is pivoted at 26 to pivot lugs 27 on the top of the plate 22 and has the other end extending loosely through an aperture in the outer end of the arm 24, a spring 28 being interposed between the pivot lugs 27 and the end of the arm and held under compression by a nut 29 on the outer end of the stem 25. The other arm of the lever 24 is connected by a link 30 with a plate or bar 31 which is mounted to slide vertically in guide-ways 32 on the opposite faces of the walls 5, and this bar or plate 31 is forked at the lower end so as to straddle the shaft 33 which extends longitudinally under the machine and serves to operate the various mechanisms thereof. This shaft has a cam disk 34 thereon with a cam groove 35 in the face thereof, which is engaged by a roller 36 on the face of the bar or plate 31, said cam groove being formed with a flat side 37, which, when it engages the roller 36, moves the plate 31 downwardly and elevates the cover plates 22 so as to receive the package thereunder. After the package is moved under the plate 22 the operation of

the cam forces the cover 12 of the carton down to the closed position and inserts the flap 14 inside the front wall of the carton. In order to avoid accumulation of paste from the flap 14 on the flange 21, the latter has ribs 38 on the inner face, against which the outer face of the flap 14 is engaged and by which it is directed downwardly in the proper manner to be tucked into the carton, said ribs 38 on the flange 21 being positioned, as indicated in Fig. 4, so that the lower extremities thereof are at the inner edge of the upper portion of the front wall of the carton.

At each side of the machine is a paste receptacle 39 which is inserted in another receptacle 40 so as to provide a water-jacket around the paste receptacle. The receptacle 40 has a pipe 41 leading from the bottom thereof to a heater 42 and another pipe 43 leads from the heater into the top of the receptacle 40 so as to circulate water from the heater 42 in the receptacle 40 for maintaining the paste or other adhesive in proper condition.

Each paste receptacle 39 has bearings 44 at opposite sides thereof in which a shaft 45 is journaled, and this shaft has a paste roll 46 fixed thereon and of suitable diameter to dip into the paste or adhesive in the receptacle 39. The side walls of the receptacles 39 are extended upwardly at one end to provide elevated bearings 47 in which a shaft 48 is journaled which, likewise, carries a paste roll 49 which bears continuously against the periphery of the roll 46 so as to receive a coating of paste from the latter. The inner ends of the shafts 45 are connected by a clutch member 50 with an intermediate shaft 51 which extends transversely of the machine and has a bevel-pinion 52 fixed thereon and meshing with the bevel-gear 53 on a shaft 54 which is mounted in bearings 55 between the carton chutes and extends longitudinally of the machine. This shaft has a sprocket 56 thereon connected by a chain 57 with a sprocket 58 on the drive-shaft 33, so that the shafts 54, 51 and 45 are rotated continuously while the machine is in operation. In order to permit either paste mechanism to be readily thrown out of operation, we have provided the clutch connection 50 between the shafts 51 and 45, which connection comprises a sleeve which has a slot 59 engaging a pin 60 on the shaft 51, so that it is capable of movement axially of the shaft and is compelled to rotate therewith, and the opposite end of this sleeve which telescopes the inner end of the shaft 45 has a notch 61 in the end to engage the pin 62 of the shaft 45 so as to connect the shafts 51 and 56 together.

Mounted at the inner side of each paste receptacle 39 is a bracket 63 which has a stud extending longitudinally of the machine and carrying a rocker-arm 64 which has a paste roll 65 journaled at one end thereof and adapted to swing in the operation of said arm alternately to a position in contact with the paste roll 49, as shown in Fig. 3, and to a position wherein a portion of the periphery projects into the notch 18 at the end of the guide-plate 16 so as to roll against the flap 14 of the carton as the latter is moved along the guide-chute. This paste roll 65 has a spur-gear 66 connected to rotate therewith and adapted, when the paste roll 65 is elevated, to mesh with the spur-gear 67 on the inner end of the shaft 48 of the paste roll 49, and this shaft 48 has a spur-gear 68 on the opposite end meshing with the spur-gear 69 on the corresponding end of the shaft 45, so that the paste rolls 49 and 46 are positively rotated at all times, and the paste roll 65 is positively rotated, when elevated, into contact with the paste roll 49, so that complete application of paste or adhesive is assured. In practice, we prefer to construct the paste roll 49 with circumferential grooves in the periphery thereof, as this facilitates the transfer of paste from the roll 46 to the roll 65.

For operating the rocker-arms 64 at the proper time to bring the rolls 65 into contact with the flaps 14 of the cartons as they are moved along the guide-chute, a bar 70 is mounted between the guide-chutes to reciprocate vertically, and forked at its lower end so as to straddle the shaft 33 and provided with a spring 71 connected with a cross-bar 72 of the frame so as to normally hold the bar 70 in the lowermost position. At the upper end of the bar a cross-arm 73 is secured thereto by bolts 74 engaging slots 75 in the bar 70 so as to permit vertical adjustment of the cross-arm on the bar 70, and the outer ends of the cross-arm 73 are forked, as indicated at 76, to receive blocks 77 which are arranged to slide laterally to and from the bar 70. These blocks have apertures 78 to receive pivot pins 79 which are clamped in slots 80 with which the inner ends of the arms 64 are provided, the intermediate portion of the pins 79 being formed with a disk 81 which is clamped against one side of the slotted extremity of the arm 64 by a nut 82 which is threaded on the pin and engages against the opposite side of the slotted extremity of the arm 64.

The bar 70 has a roller 83 adjacent the lower end which rides on a cam 84 fixed on the shaft 33, said cam being formed with an elevated portion 85 which, at the proper time, raises the bar 70 against the tension of the spring 71 so as to rock the arms 64 and move the rollers 65 downwardly to a position wherein the periphery of the roller bears against the outer surface of the flap 14 of the carton during the time that it is being drawn from the guide-plates 11

and 15 under the guide-plate 16. It will be observed by referring to Fig. 2, that the guide-plate 15 extends just beyond the point at which the roller 65 bears against the flap 14 so as to afford a backing for holding the flap 14 outwardly at this point against the paste-applying roller. The tension of the spring 71 and the weight of the bar 70 and parts connected therewith serve to hold the roller 65 in contact with the roller 49 in the elevated position, and the gears 66 and 67 in mesh with one another, and the adjustment of the cross-arm 73 on the upper end of the bar 40 and the adjustment of the pins 79 in the slots 80 of the rocker-arms 64 permit the operation of the arms to be nicely regulated, so that the rollers 65 properly engages the flaps 14 of the carton in the lowermost position so as to insure the required coating of paste or adhesive being applied to the surface of the flap 14. In this connection, it might be stated that it is desirable that the paste roll 65 should be of at least sufficient circumferential length so that it does not make more than one complete revolution at each application of paste to the flap 14, as otherwise the portion of the flap 14 engaged by the roller 65, after a complete revolution has been made, would not receive the requisite coating of paste and, furthermore, the operation of the bar 70 should be properly timed, with reference to the rate of travel of the carton through the guide-chute, so as to be lowered to engage the carton flap 14 just as the forward end of the flap passes the point of contact of the paste-applying roll and is elevated just as the rear extremity of the flap passes beyond such point so as to avoid the possibility of the paste being applied to the surface of the plate 15, as this would interfere with the freedom of movement of the flap 14 over the surface of the plate.

To avoid an excessive quantity of paste being applied to the paste roll 65 and to insure a uniform application of paste to the flap 14, we have provided a pair of guides 86 at opposite sides of the paste receptacle 39, within which the ends of a scraper 87 engage and are adapted to slide so that the scraper is movable to and from the periphery of the paste roll 46. Adjusting rods 88 are connected to the opposite ends of the scraper 87 and project outwardly through apertures 89 in the wall of the paste receptacle 39 and each has a nut 90 threaded onto the end to regulate the proximity of the scraper 87 to the periphery of the paste roll 46, a spring 91 being interposed between the wall of the paste receptacle and a fixed collar 92 on the rod 88 for the purpose of holding the scraper 87 outwardly from the periphery of the paste roll 46.

In the operation of the machine a quantity of paste in maintained in the receptacle 39 so that the roller 46 dips therein and the clutches 50 are positioned so as to connect the shafts 45 with the intermediate shaft 51, so that the paste rolls are operated continuously by the shaft 33. If the paste or adhesive used is of such nature that it is necessary to maintain it in a heated condition, the heater 42 is set in operation so as to circulate water through the receptacle 40 around the paste receptacle 39.

The cartons are fed into the machine and the necessary operations effected as they are advanced through the guide-chutes, so that as the cartons reach the position just preceding the point at which the paste is applied, the cover 12 is partially closed down and passes between the plates 11 and 15. As the carton reaches the point where the cover flap 14 begins to move past the point where the roll 65 may contact therewith the elevation 85 of the cam 84 engages the roller 83 and lifts the bar 70, thereby rocking the arms 64, so that the paste rolls 65 are brought into contact with the outer surface of the flap 14 and rotate as the flap is drawn thereunder, thus applying a coating of paste along the outer face of the flap 14. The cam elevation 85 is of such length that the paste roll 65 remains in contact with the flap 14 until the rear end of the later is about ready to pass beyond the point of engagement of the roller with the flap, whereupon the cam roller 83 is released from the cam elevation 85 and allows the bar 70 to drop downwardly under the tension of the spring 71 and elevate the paste roll 65 to the position shown in Fig. 3, wherein the gear 66 meshes with the gear 67 and the paste roll 65 contacts with the paste roll 49 and receives a coating of paste therefrom preparatory to the next succeeding operation of the paste-applying mechanism.

The carton, during the time that the paste is being applied to the flap 14, is moved along by the conveyor chains 7 under the angular plate 16 which holds the cover 12 in substantially the same position which it occupied as it emerged from engagement with the plates 11 and 15, the arched portion 19 of the plate 16 permitting the pasted surface of the flap to move freely under the guide 16 without displacing the paste on the flap or covering the inner surface of the plate 16 therewith, and the carton continues its movement beyond the guide-plate 16 and under the closing plate 22, which has just been raised by the operation of the cam disk 34. Inasmuch as the carton flap 14 is flat and the ribs 38 on the flange 21, with which the closing plate 22 co-operates, are curved, the upper and lower edges only of the flap 14 engage the ribs 38, and the inter-

mediate portion is held away therefrom, so that the paste is not disturbed on the outer surface of the flap. The movement of the carton is interrupted when it reaches the position directly underneath the closing plate 22, and thereupon the cam 34 on the shaft 33 elevates the bar 31 so as to operate the plates 22 to press the carton covers 12 down and force the cover flaps 14 inside the front wall of the carton, as shown in Fig. 4, so that the pasted exterior of the flap 14 bears against the inner surface of the carton wall, the flare 20 of the side wall of the chute serving at the time of closing the carton to permit the upper portion of the package or carton to spread slightly, thereby facilitating the inserting of the flap 14 inside the carton. The cover plate 22 remains in the lowermost position as the carton is again moved forward into the discharge ends of the chute, which latter is provided with a top plate 93 or is otherwise constructed to hold the carton in closed position and allow the paste to set so as to seal the cover of the carton in the closed position.

While we have shown and described our invention in a preferred form, we are aware that various changes and modifications may be made without departing from the principles of the invention, the scope of which is to be determined from the appended claims.

We claim as our invention:

1. In a carton sealing machine, the combination of a carton chute, means for advancing cartons successively along the chute, guides for holding the carton covers in an upraised position as the cartons are advanced through the chute, a paste receptacle adjacent the chute having a paste roller for transferring paste from the receptacle to a flap on the edge of the carton cover as it is moved along the chute in the upraised position, an arcuate guide at one side of the chute beyond the paste-applying mechanism adapted to be engaged by the cover flap, and a member extending over the chute adjacent the arcuate guide and adapted to be depressed as each carton is moved thereunder so as to close the carton cover and move the cover flap downwardly along the arcuate guide and thereby insert the flap inside the carton against a side wall thereof, said member being adapted to remain in the depressed position as the carton is moved therebeyond.

2. In a carton sealing machine, the combination of a paste-applying mechanism and a carton closing mechanism, a carton conveyor for advancing cartons successively past the paste-applying mechanism and the carton closing mechanism so as to apply a coating of adhesive to a flap on the edge of the carton cover and thereafter move the cover to the closed position and tuck the adhesive coated flap inside the carton.

3. In a carton sealing machine, the combination of a carton conveyor, mechanism adjacent the conveyor and operating as each carton is carried thereby to move the carton cover to the closed position and insert a flap on the edge of the cover inside the carton, and paste-applying means adjacent the conveyor and in advance of the carton closing mechanism comprising a paste receptacle and a paste roller actuated to receive a coating of paste on the periphery thereof and bear against the cover flap of the carton as the latter is moved therealong so as to apply a coating of paste to the outer surface of the flap.

4. In a carton sealing machine, the combination of a carton conveyor, a paste-applying mechanism adjacent the conveyor comprising a paste receptacle having a supply roller and a paste-transferring roller shiftable from a position in engagement with the paste supply roller to a position to engage a flap on the edge of a carton cover as the carton is advanced by the conveyor, and a closing mechanism to which the carton is advanced by the conveyor after the paste is applied to the cover flap, said closing mechanism being actuated so as to move the carton cover to the closed position and insert the cover flap inside the carton.

5. In a carton sealing machine, the combination of a carton conveyor, a carton closing mechanism adjacent the conveyor and a paste applying mechanism for applying paste to a flap on the edge of the carton cover before the carton is advanced to the carton closing mechanism, said paste applying mechanism comprising a paste receptacle having a paste-transferring roller movable to a position to receive a coating of paste from the paste receptacle and to a position to apply a coating of paste to the cover flap, mechanism for moving the transferring roller alternately to the aforesaid positions, and adjusting mechanism for regulating the movement of the transferring roller.

6. In a carton sealing machine, the combination of a carton conveyor, a carton closing mechanism adjacent the conveyor adapted to move the carton cover to the closed position and tuck a flap on the edge of the cover inside the carton, a paste-applying mechanism for applying paste to the carton flap before the carton is advanced to the closing mechanism, and guides along which the carton cover and flap are moved and by which they are held in a predetermined position as the paste is applied to the cover flap.

7. In a carton sealing machine, the combination of a carton conveyor, mechanism adjacent the conveyor for moving the car-

ton cover to the closed position and tucking a flap on the edge of the cover inside the carton, and paste mechanism adjacent the conveyor and adapted to apply paste to the cover flap before the carton is advanced to the closing mechanism, said paste mechanism comprising a paste receptacle having a water jacket, a heater connected with the water jacket, and a paste roller operable to transfer paste from the receptacle to the cover flap of each carton as the carton is advanced by the conveyor.

FRANK M. PETERS.
WARREN H. HUNGERFORD.