

Sept. 22, 1931.

J. L. KELLOGG ET AL

1,824,401

PACKAGING MACHINE

Filed Dec. 14, 1923

18 Sheets-Sheet 1

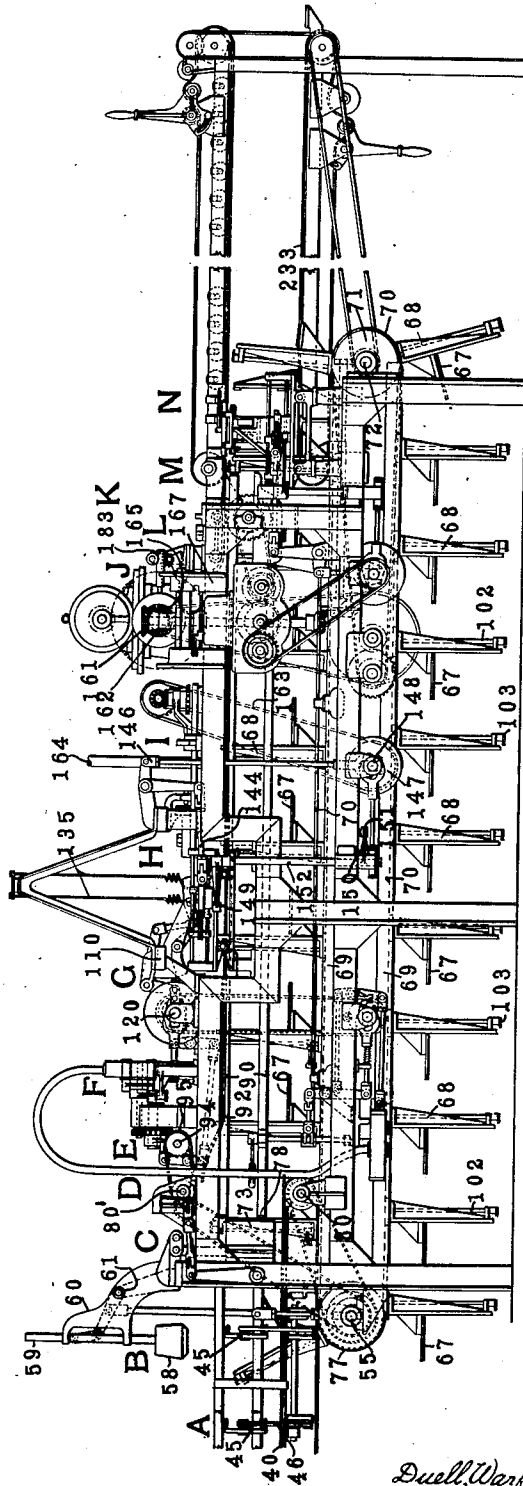


Fig. 1

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18 Sheets-Sheet 2

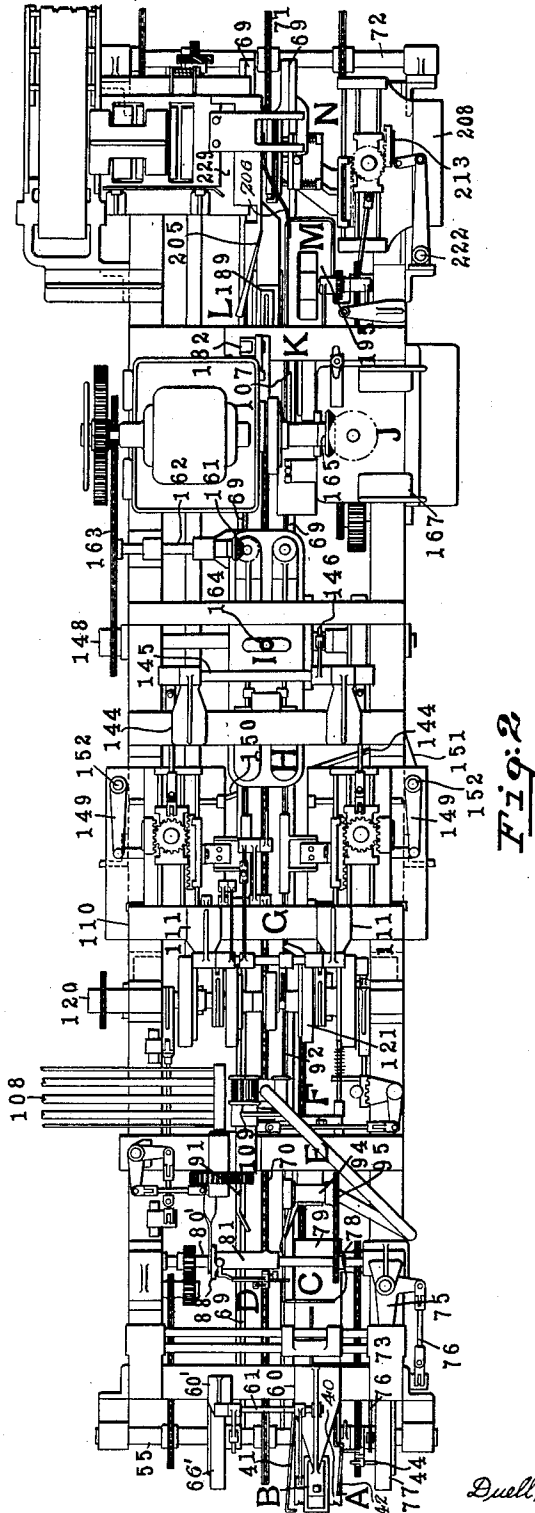


Fig. 2

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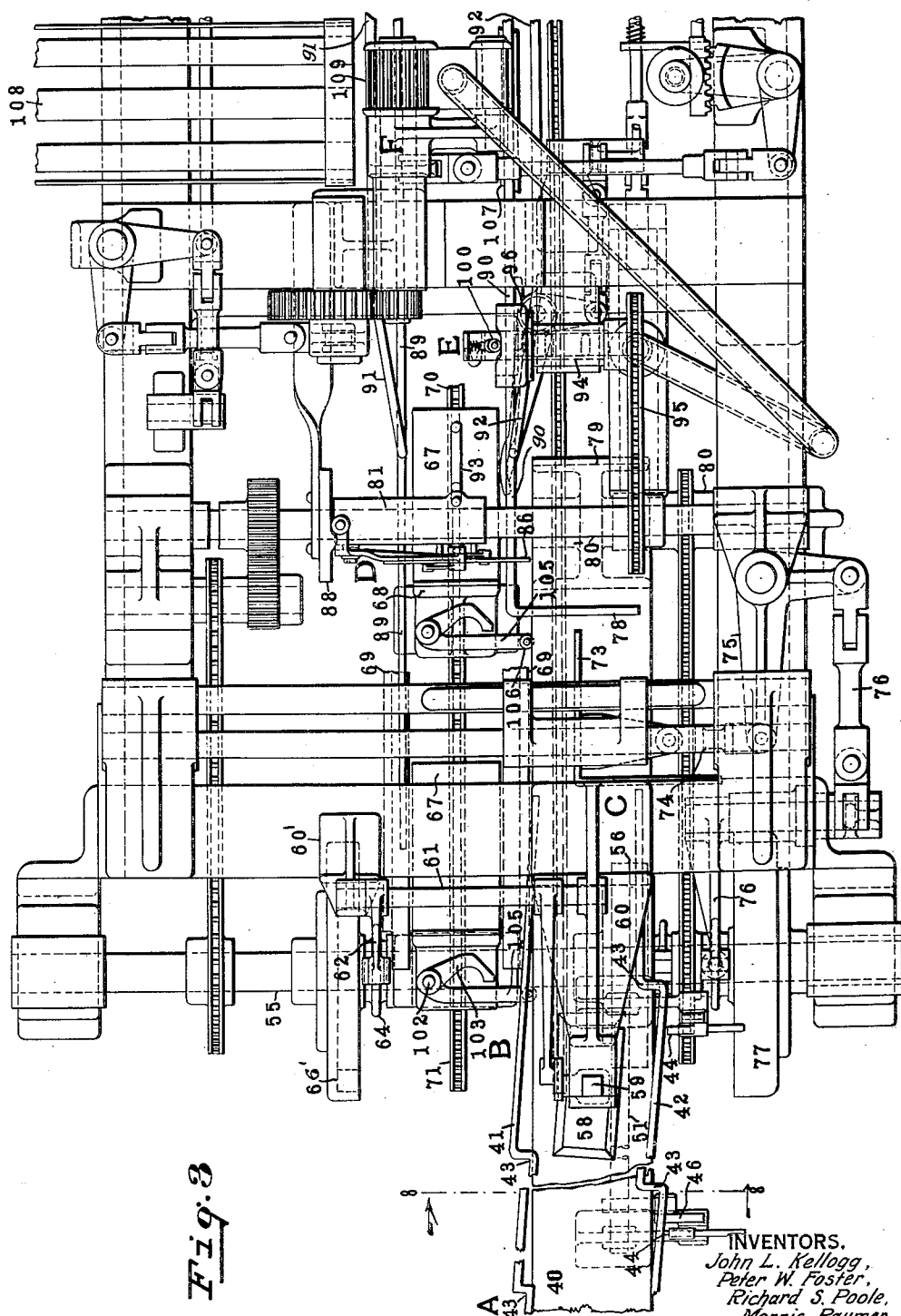
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18 Sheets-Sheet 3



INVENTORS.
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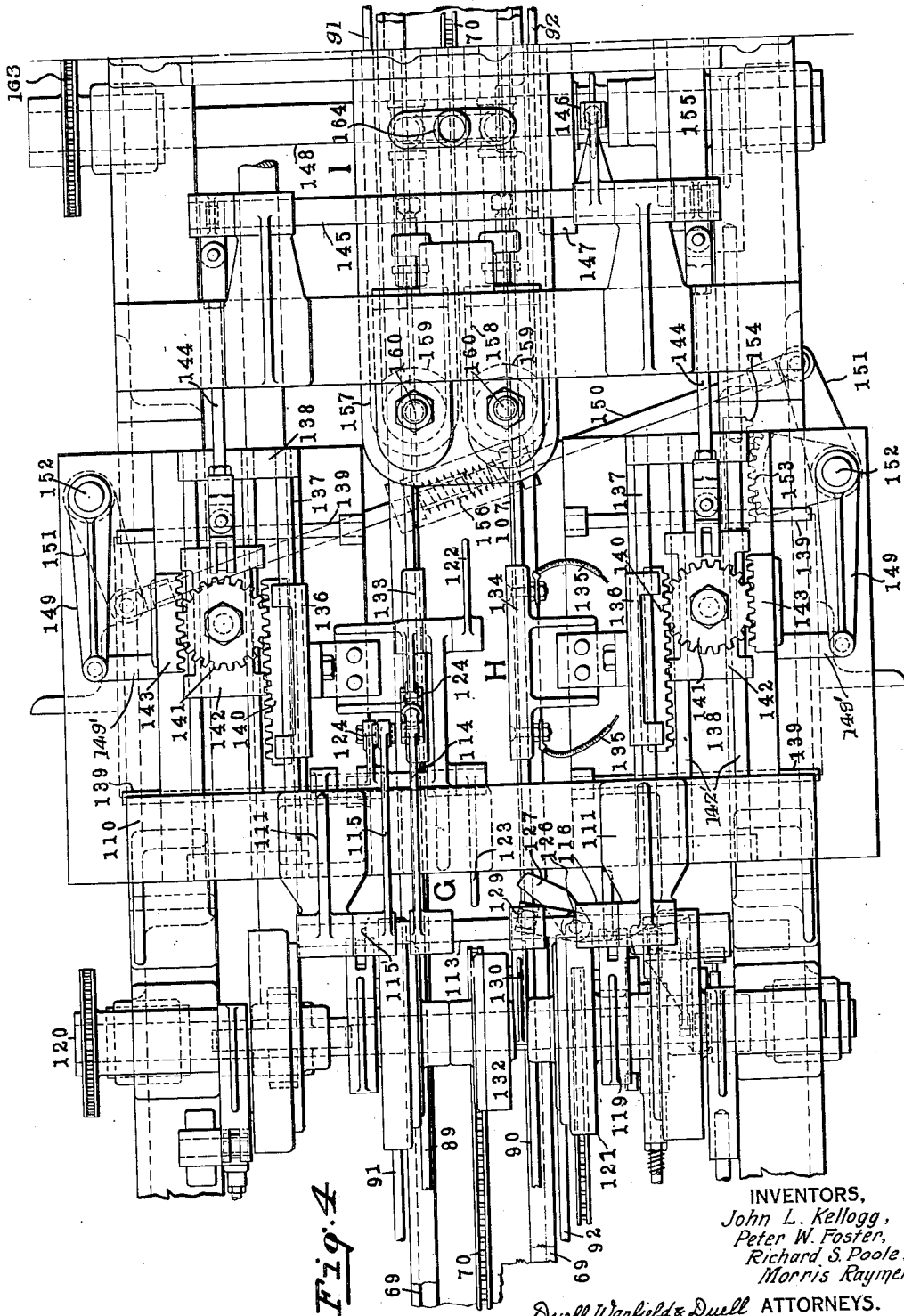
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18 Sheets-Sheet 4



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18 Sheets-Sheet 5

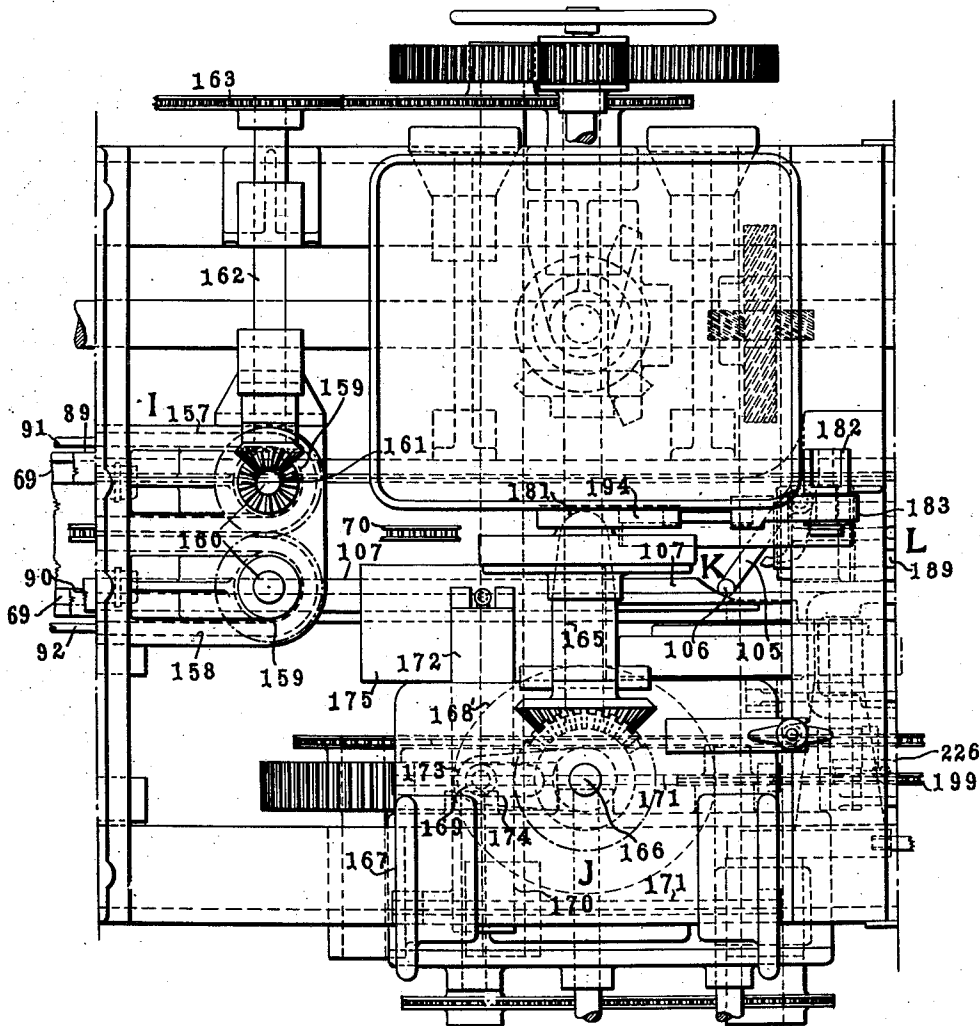


Fig. 5

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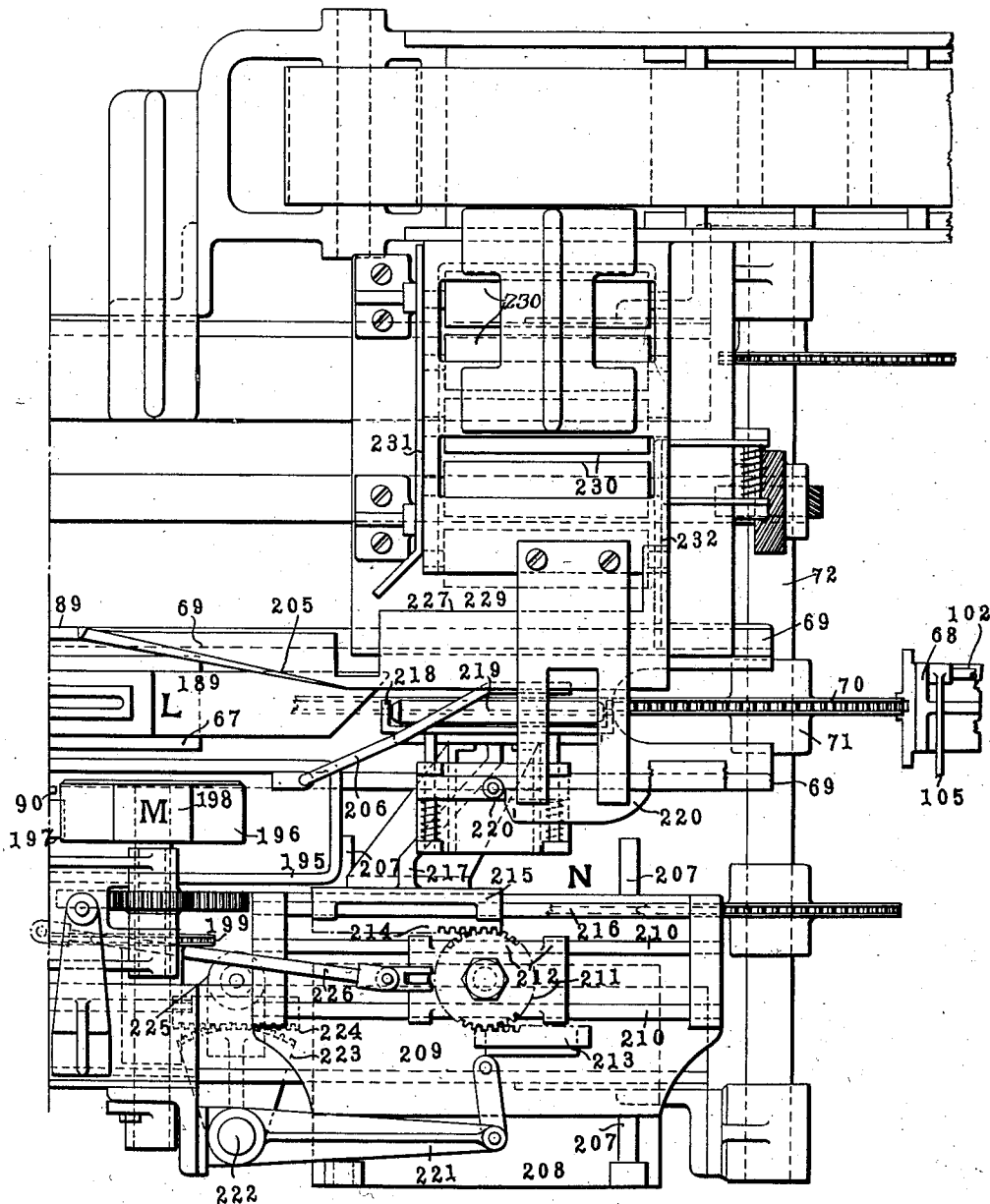


Fig. 6

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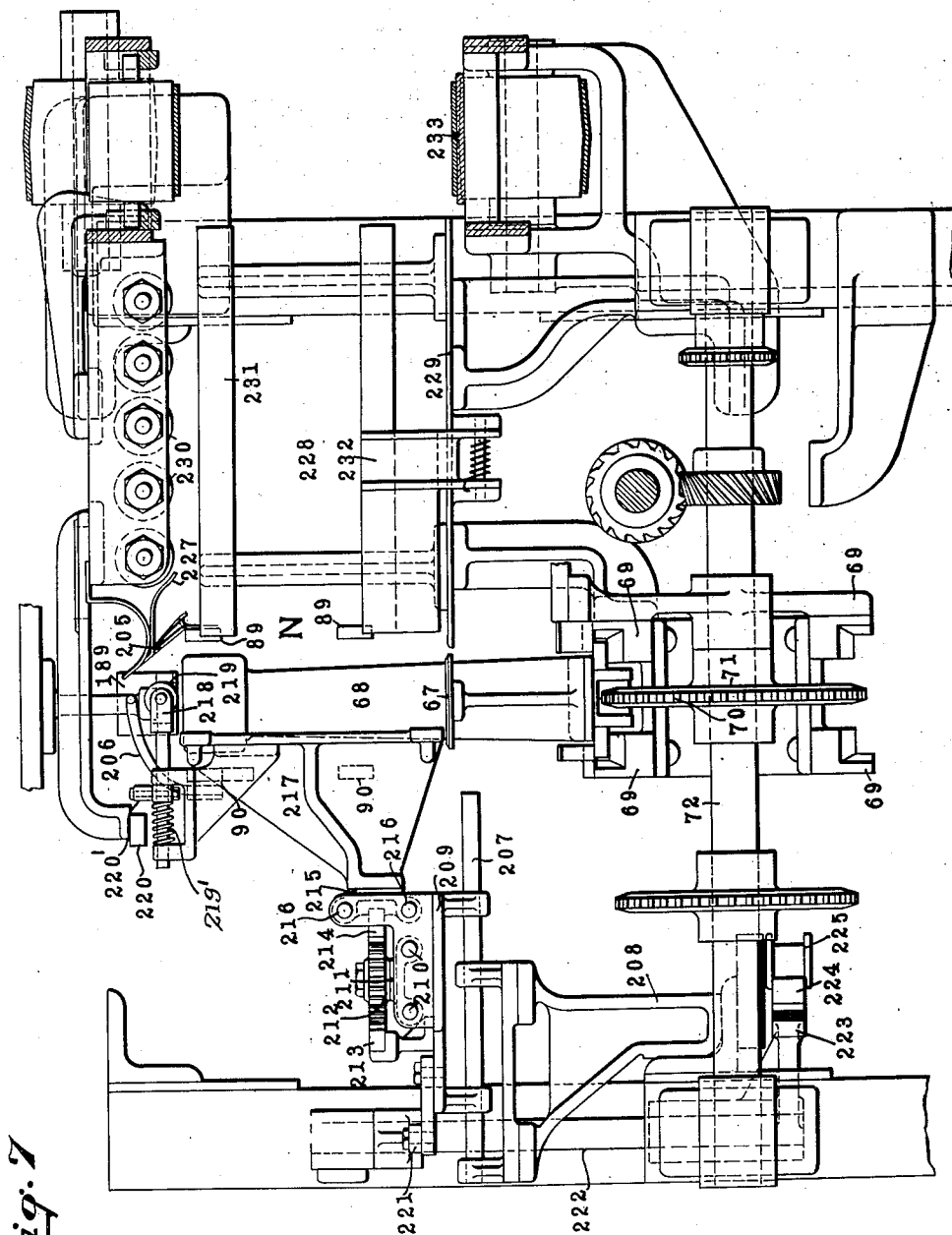


Fig. 7

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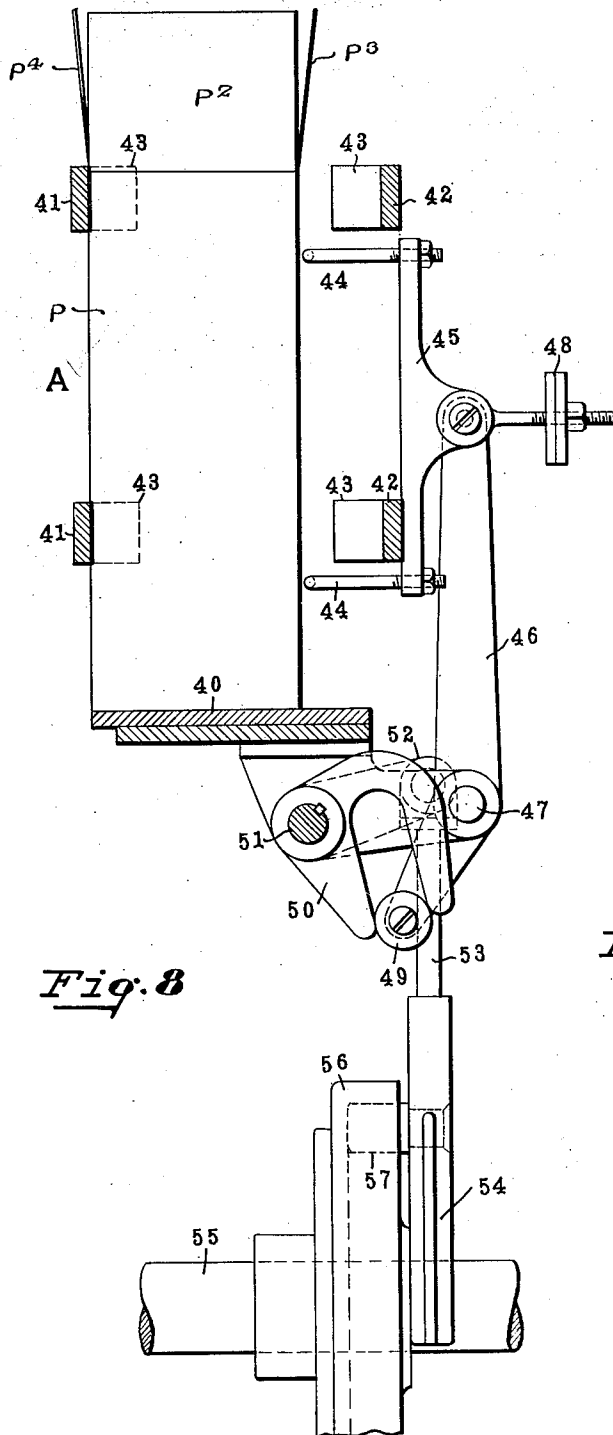


Fig. 8

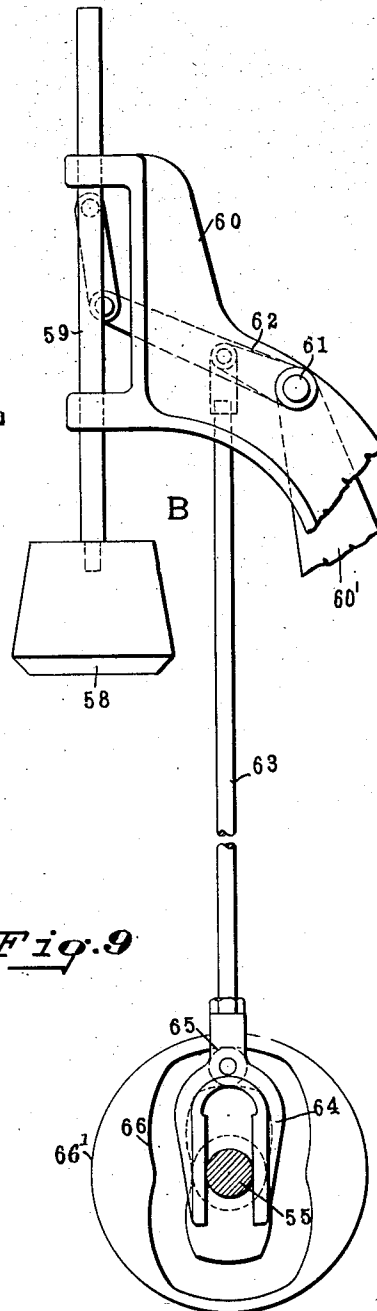


Fig. 9

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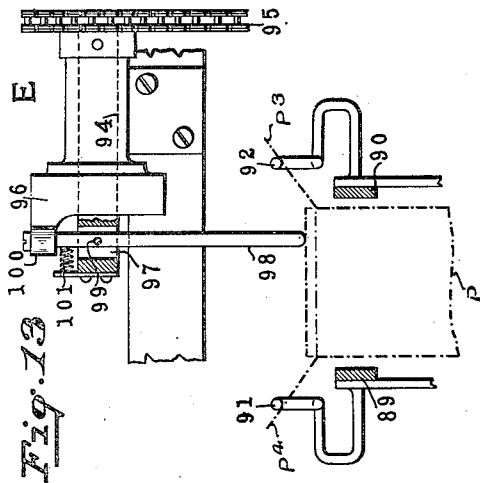


Fig. 13

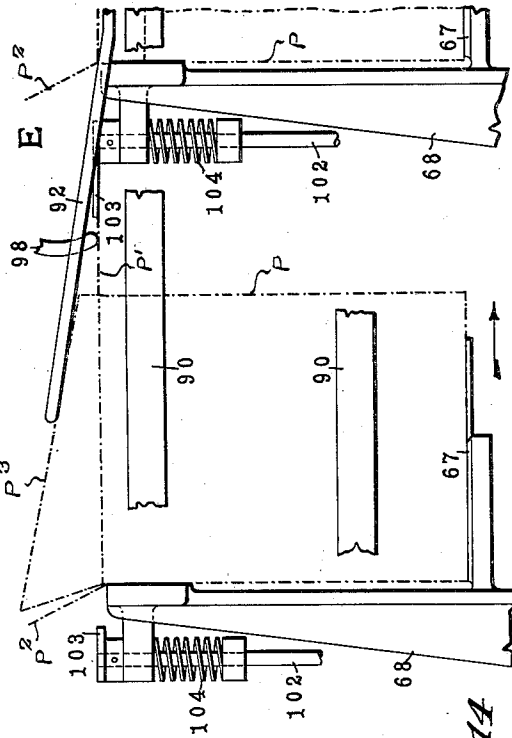


Fig. 14

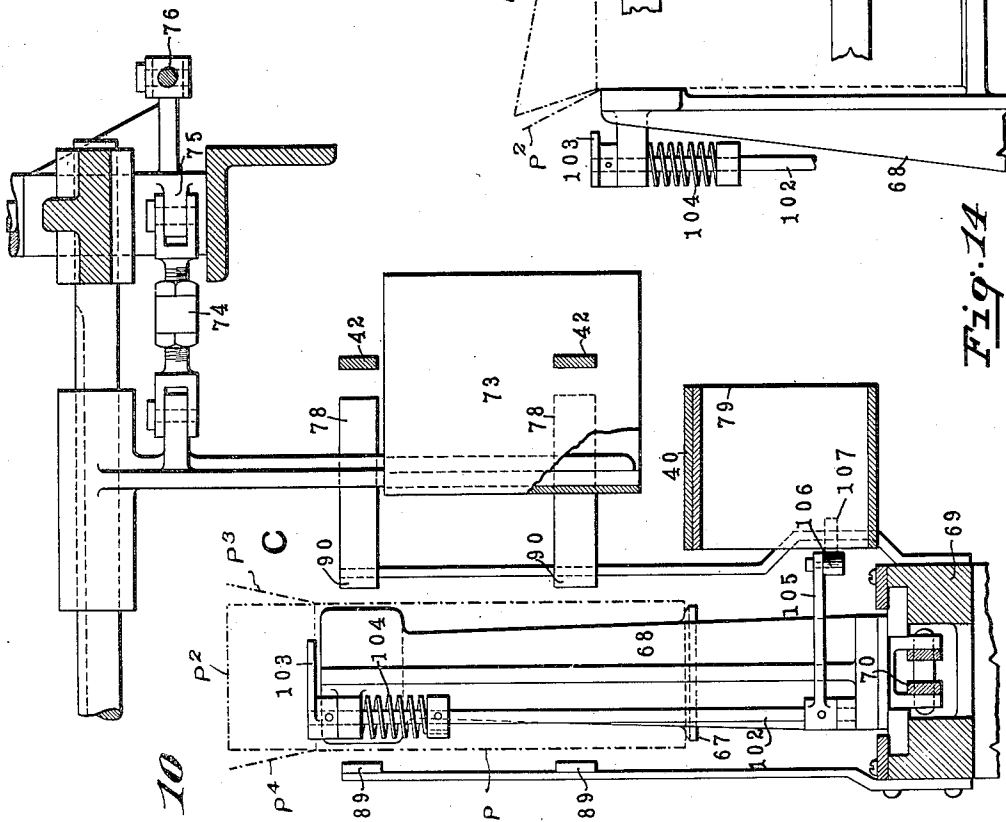


Fig. 10

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Fig. 11

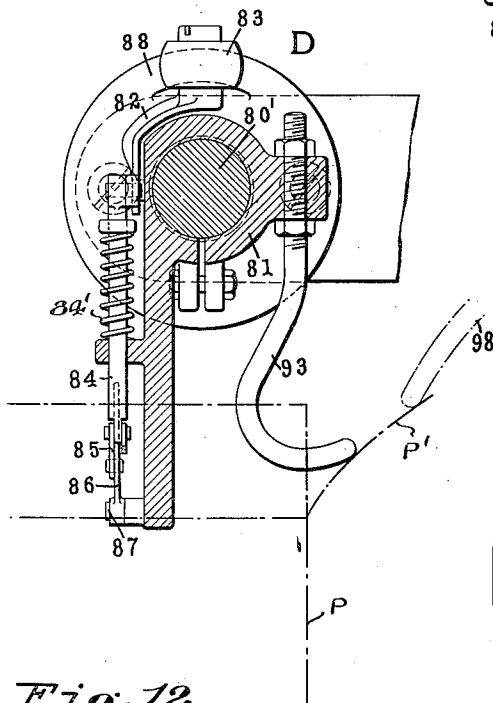
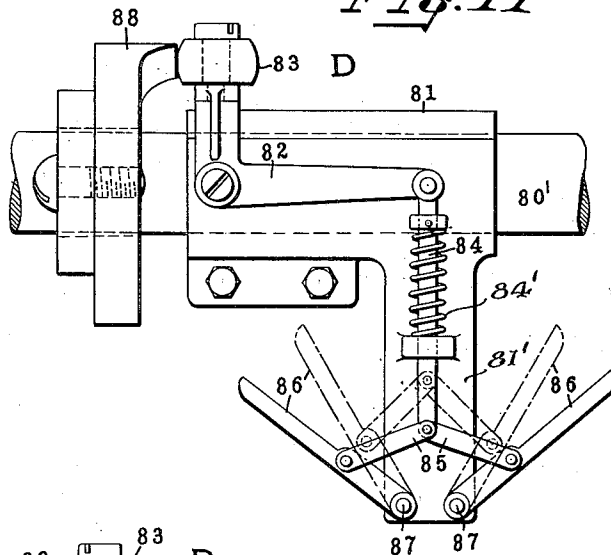
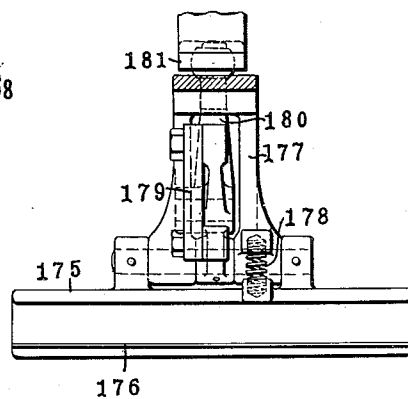


Fig. 12

Fig. 24



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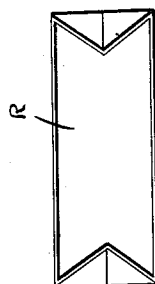
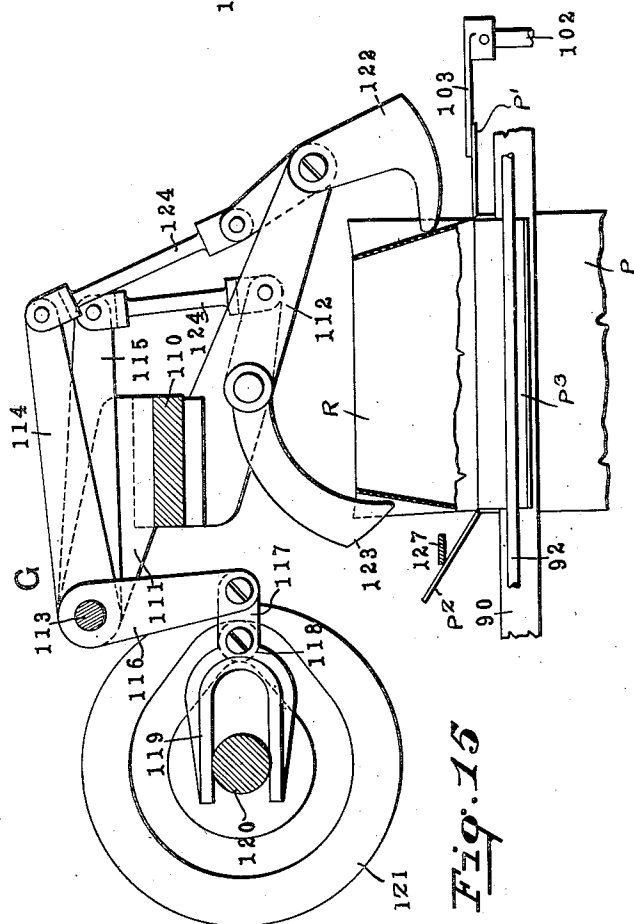
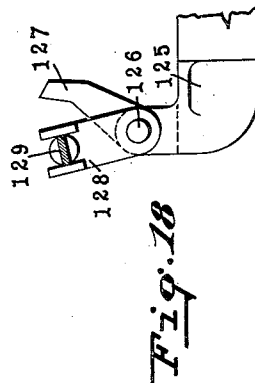
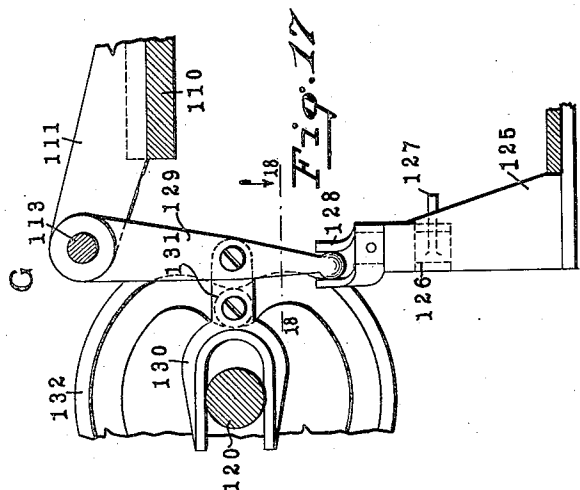
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INVENTORS,
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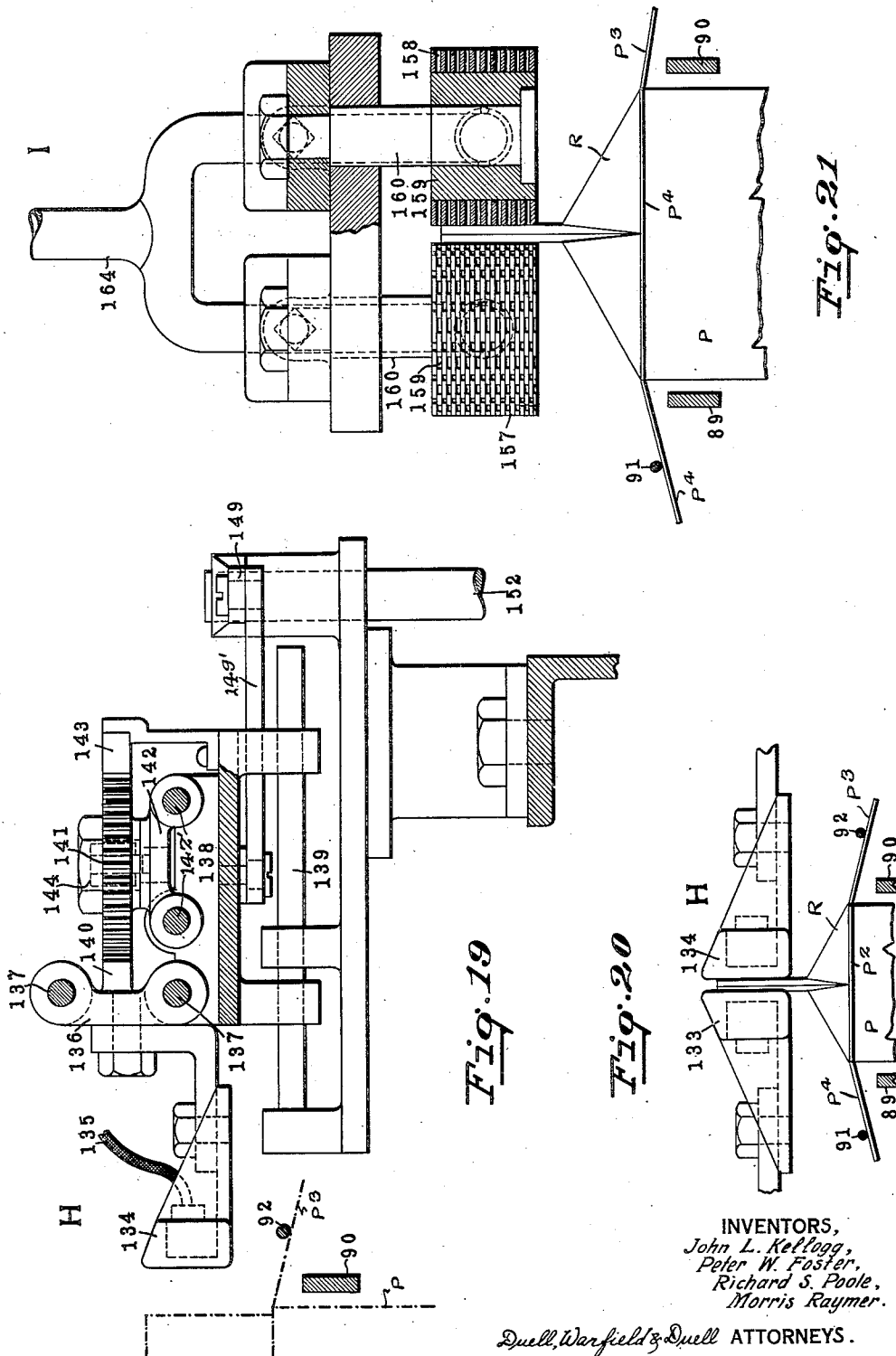
J. L. KELLOGG ET AL

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18 Sheets-Sheet 12



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PACKAGING MACHINE

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Fig. 25

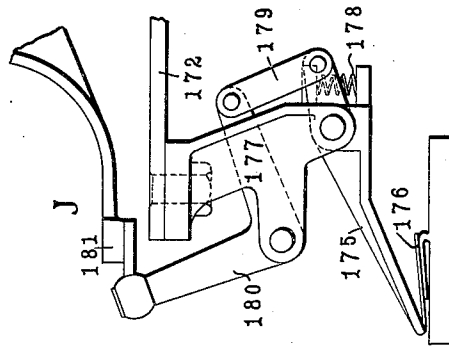
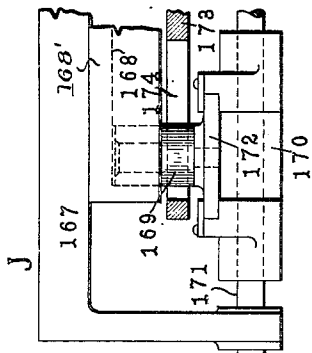


Fig. 23

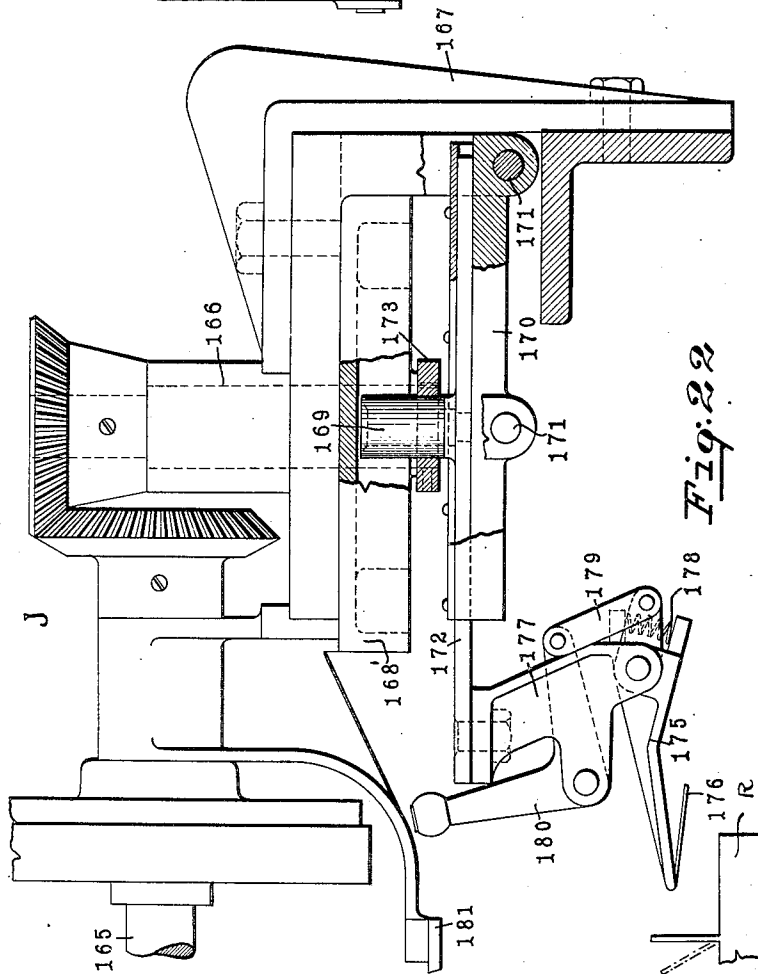


Fig. 22

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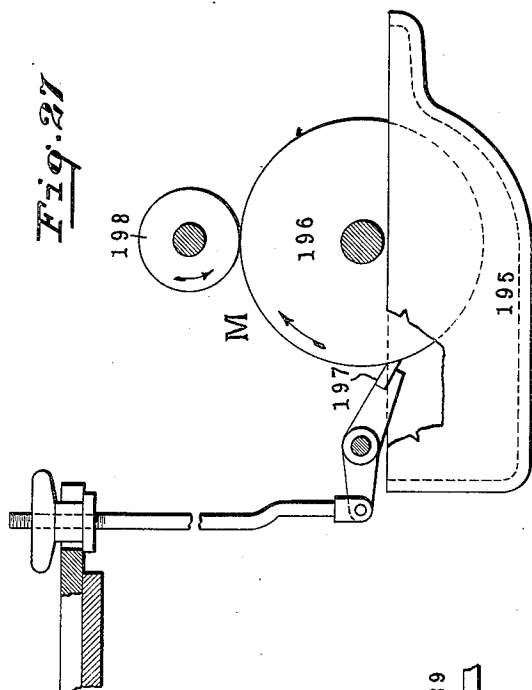


Fig. 27

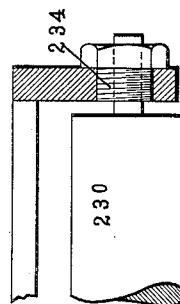


Fig. 35

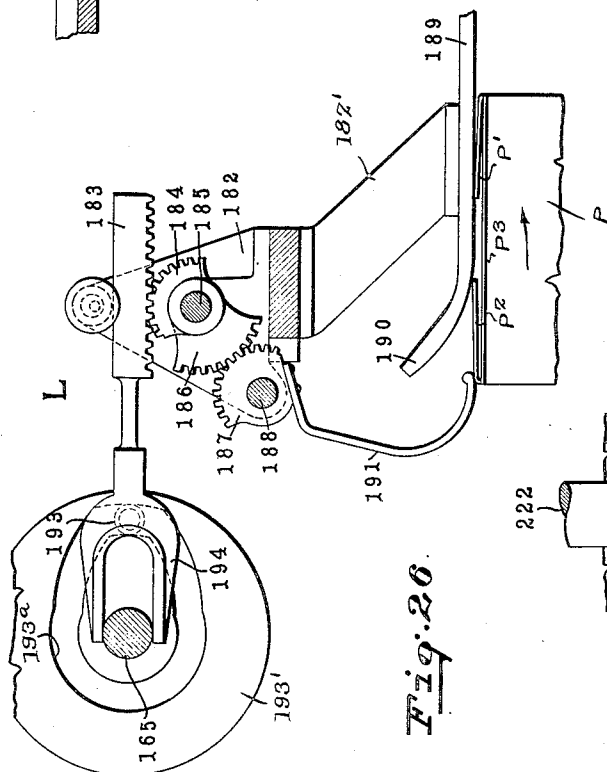


Fig. 26

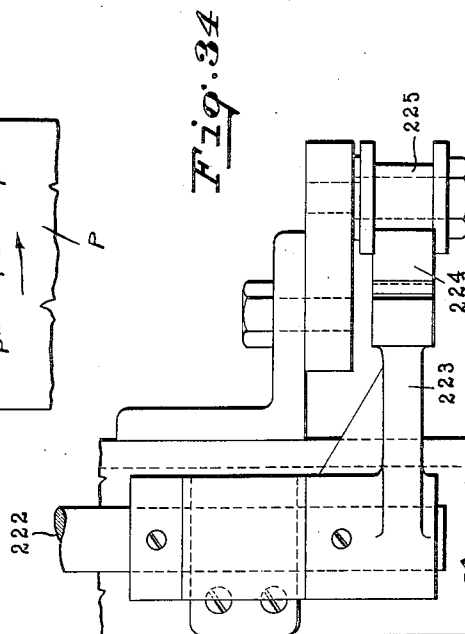


Fig. 34

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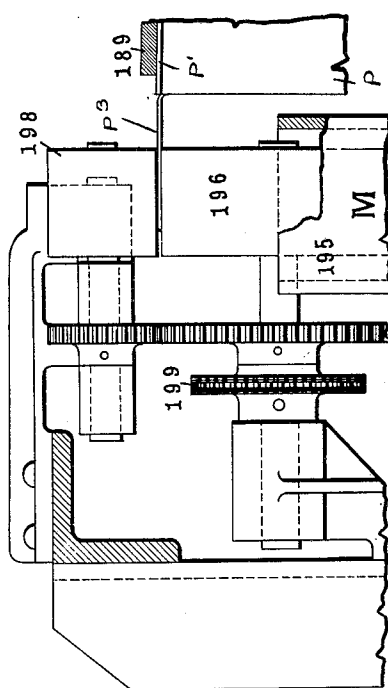
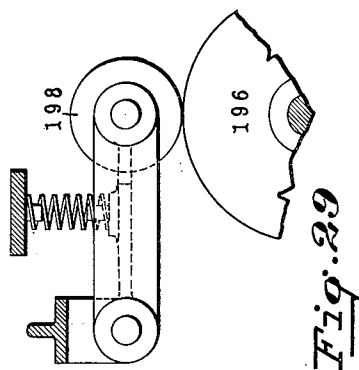
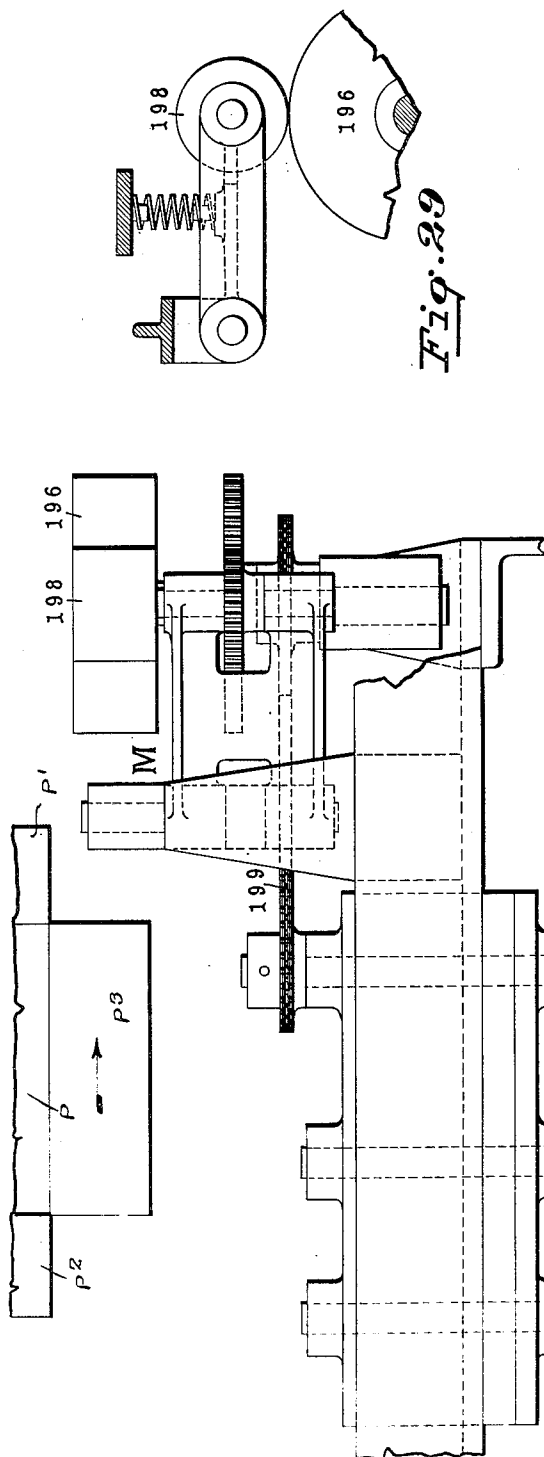


Fig. 28

Fig. 30

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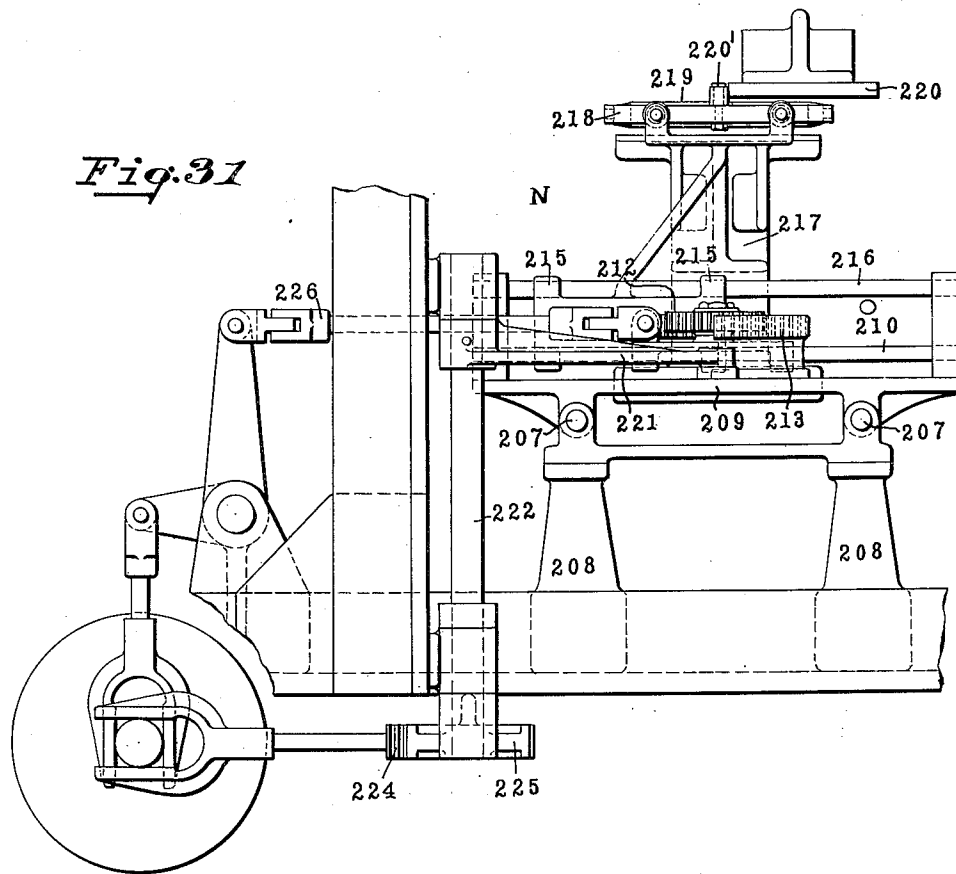


Fig. 32

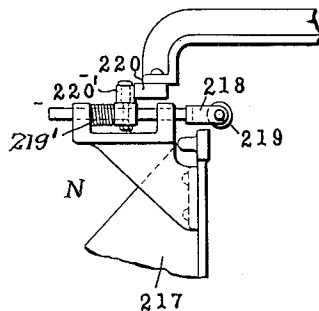
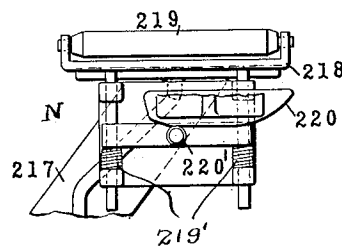


Fig. 33



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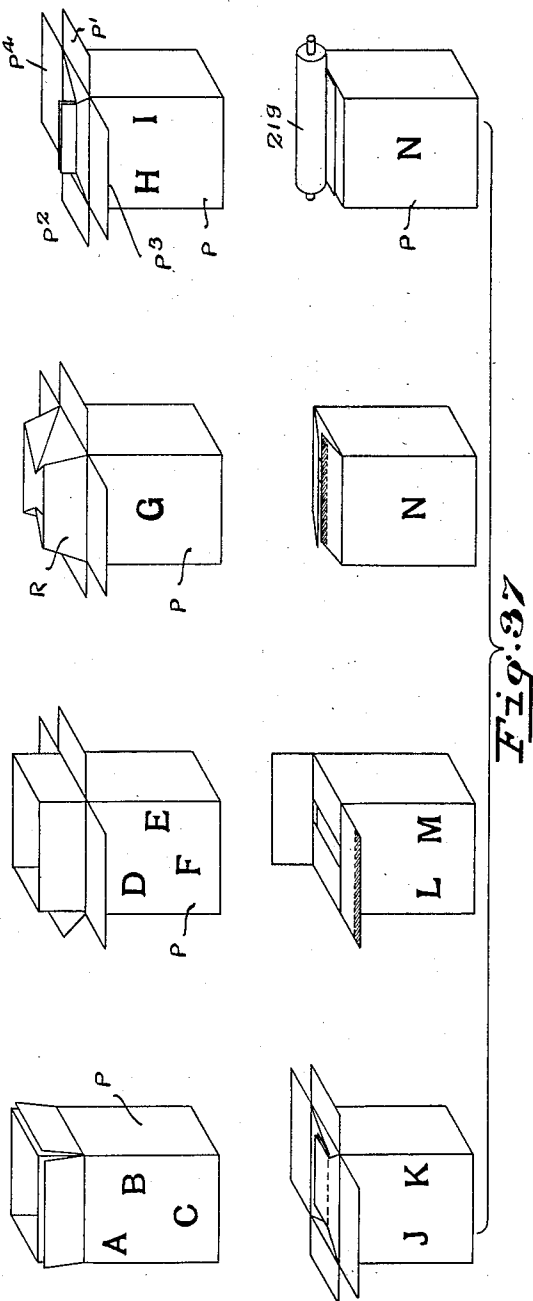
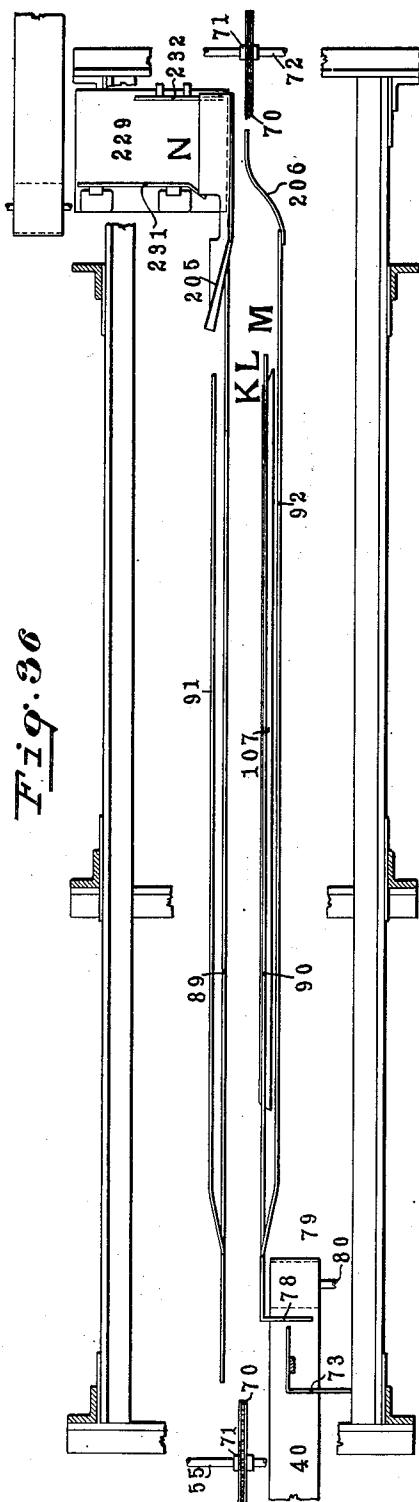
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18 Sheets-Sheet 17



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18 Sheets-Sheet 18

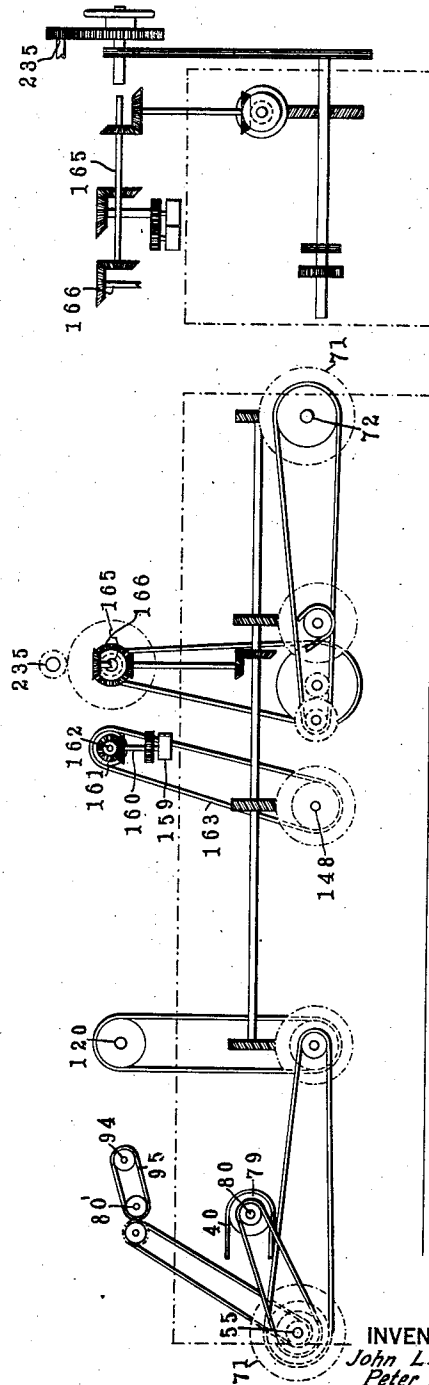
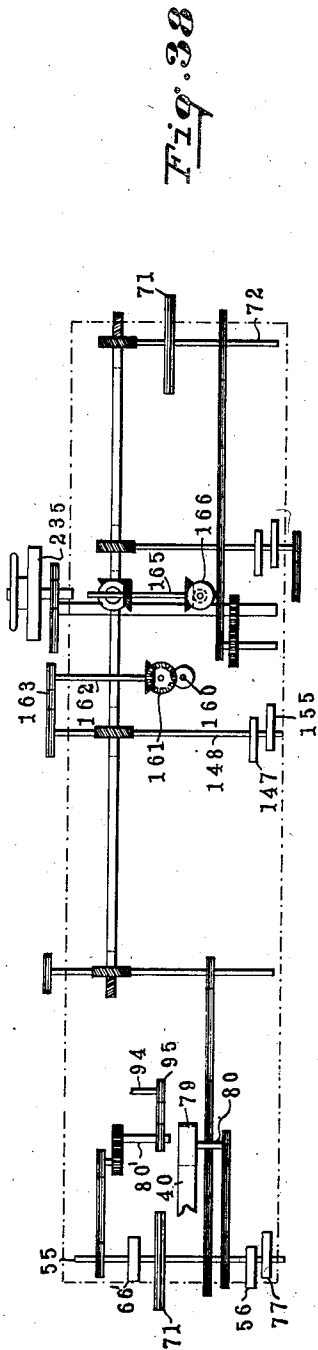


Fig. 40

Fig. 39

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UNITED STATES PATENT OFFICE

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PACKAGING MACHINE

Application filed December 14, 1923. Serial No. 680,664.

This invention relates to a packaging machine and aims to provide a device of this character primarily adapted for use in connection with the packaging of materials, particularly food stuffs such as, for example, corn flakes, bran, etc.

It is an object of the present invention to provide a packaging machine which will be structurally superior and functionally advantageous in comparison with machines having somewhat similar objects.

A further object resides in the construction of a machine adapted to close material containing packages without injuring the material during the various manipulations to which the package is subjected.

A still further object is the construction of a machine preferably embracing a number of units, the functions of these units being such that an article manipulated thereby will be efficiently operated on.

Another object of the present invention is the provision of an apparatus which will be automatic in operation and which, when utilized in conjunction with packages of the type hereinafter referred to, will not alone close the same but will also seal the parts to prevent the entrance of air, moisture, etc.

Still another object is that of furnishing a machine of the type described, preferably embracing a number of units which units may be used to advantage either independently or in combinations other than that shown in the illustrative embodiment hereinafter referred to.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a side view of one form of

packaging machine embodying the construction of the present invention.

Fig. 2 is a plan view thereof,

Figs. 3, 4, 5 and 6 are fragmentary plan views showing respectively consecutive portions of the machine,

Fig. 7 is a rear end view of the apparatus,

Fig. 8 is a transverse, sectional view taken along the line 8—8 looking in the direction of the arrows indicated in Fig. 3,

Fig. 9 is a fragmentary, side elevation of the mechanism for disposing the material within the container.

Fig. 10 is a fragmentary, enlarged sectional view of a portion of the transfer mechanism,

Fig. 11 is a front view of the spreader mechanism,

Fig. 12 is a sectional, side view through the same,

Fig. 13 is a fragmentary, transverse view showing mechanism of the machine which manipulates certain portions of the package,

Fig. 14 is a side elevation showing certain of the mechanism shown in Fig. 13,

Fig. 15 is a sectional, side view of the folding mechanism,

Fig. 16 is a plan view of a package after the same has been shaped by the mechanism illustrated in Fig. 15,

Fig. 17 is a fragmentary, side elevation of certain of the mechanism utilized to manipulate one of the portions of the package,

Fig. 18 is a fragmentary, plan view thereof, taken along the lines 18—18 looking in the direction of the arrow indicated in Fig. 17,

Fig. 19 is a fragmentary, transverse, sectional view of a detail of the sealing mechanism,

Fig. 20 is a fragmentary view of certain parts of the mechanism shown in Fig. 19, but illustrating the parts in a different position.

Fig. 21 is a fragmentary, partly sectional view taken transversely through a portion of the machine and showing a sealing mechanism which may act subsequently to that shown in Figs. 19 and 20,

Fig. 22 is a further transverse, sectional, fragmentary view taken through a part of

the machine and showing the parts of the folding mechanism,

Fig. 23 is a detail view showing parts of this folding mechanism in another position,

Fig. 24 is a face view of a portion of the folding mechanism illustrated in Figs. 22 and 23,

Fig. 25 is a detail of the operating mechanism utilized in connection with the mechanism shown in Fig. 22,

Fig. 26 is a fragmentary, sectional side view of a further portion of the folding mechanism,

Fig. 27 is a fragmentary side elevation showing certain portions of the gluing mechanism,

Fig. 28 is a fragmentary plan view of the gluing mechanism and drive therefor,

Fig. 29 is a fragmentary side view of a detail thereof,

Fig. 30 is an end view of the same,

Fig. 31 is a fragmentary side elevation of the mechanism for sealing the carton flaps and for ejecting the cartons from the carrier, also shown in Figs. 6 and 7,

Fig. 32 is a fragmentary view of a detail thereof,

Fig. 33 is a plan view of the detail of Fig. 32,

Fig. 34 is a fragmentary view of a detail of the operating mechanism for the sealing and ejecting mechanism,

Fig. 35 is a fragmentary view of one of the roller mountings,

Fig. 36 is a somewhat diagrammatic plan view of the bed of the machine,

Fig. 37 is a collective view illustrating different forms assumed by the package in the successive steps of manipulation to which it is subjected in its passage through the machine,

Fig. 38 is a somewhat diagrammatic plan view of the driving mechanism utilized for the various units,

Fig. 39 is a side elevation thereof, and

Fig. 40 is an end view of the same.

According to the embodiment of the invention illustrated in the present application, a machine is provided which is particularly adapted to receive a box of cardboard or similar material having its base closed and its upper end opened, and having at its upper end a number of flaps which are adapted to be folded in a manner to provide an adequate seal. Disposed within the box is a bag or liner of suitable material such as, for example, wax impregnated paper, having its neck or mouth unsealed and being filled with a loose substance which is to be packaged. It is to be understood that the operations of forming the box and the bag or liner, filling the latter with the material to be packaged, and disposing the same within the box either before or after the filling operation, may be accomplished by means of a

machine or machines arranged in advance of that which forms the subject matter of the present application, or obviously, these operations, or certain of the same, may be performed by hand.

Conceding that articles of the nature afore-described are introduced into a machine embodying the construction herewith described and illustrated, the material or substance within the box will be first properly distributed or stowed and subsequently the mouth of the bag or liner will be sealed and disposed within the body of the box after which the flaps of the latter will be folded upon themselves to in turn seal this portion of the package and the sealed box containing the sealed bag within which the material is packed will be automatically delivered from the end of the machine thereby effecting great saving in expense, labor and time.

For the sake of avoiding confusion, the succeeding description has been divided into chapters, each referring to one of the particular units of the mechanism by means of which, at a predetermined station in the path of travel of the package, certain operations are performed tending towards the closing or sealing of the package and the final delivery thereof. With this in mind, the description immediately following will deal with the construction and operation of the mechanism whereby the package is introduced into the machine proper and by means of which the substance contained within the said package will be disposed to permit of the subsequent sealing operations.

In order that the carton or similar package may be more easily followed in its course through the machine in the following description, and that successive operations thereon by the different mechanisms may be more clearly understood, this carton is designated as a whole throughout the different views of the drawings and in the following detailed description by P. Also the leading flap of the carton as the latter progresses through the machine is designated P¹, the following flap by P² and the opposing lateral flaps P³ and P⁴ respectively. The liner for the carton is also designated in the several views by the reference numeral R.

Package spacing and content stowing mechanism (stations A and B)

Referring to Figs. 1, 2, and 3, it will be perceived that at the front end of the machine there is provided a conveyor belt 40 which may be mounted for movement in a plane corresponding to that in which the bed of the machine is disposed. This conveyor may be connected with, or form a part of a machine in which the liners or bags are filled, and adjacent the entry end of the present machine spaced guides 41 and 42 are provided, arranged one at each side of the conveyor and

serving, in the present instance, in conjunction with other mechanism hereinafter described, to act as spacers for the articles entering the machine so that the same are disposed at proper intervals throughout the entire mechanism. With this in mind, the guides 41 and 42 may be provided with offset portions 43 inclined to the vertical plane of the path of travel of the conveyor. Reference being had to Fig. 8, it will be perceived that a pair of pusher fingers 44 are arranged adjacent the offset portions 43 of the guide 42, these fingers being attached to a bracket 45 pivotally carried by one end of a bell-crank 46 which is in turn pivotally supported as at 47. The brackets 45 are normally held in a predetermined position by having counterweights 48 attached to stems extending beyond the upper arms of the bellcranks 46. The opposite arm of each bell crank 46 carries a roller 49 engaged by a fork 50 which is secured to a shaft 51. Operating the sets of fingers 44 is a crank 52 to which a pitman 53 is attached, the latter terminating in a forked end 54 straddling a drive shaft 55 which carries a cam member 56 having a cam track within which a roller 57 carried by the pitman 53 rides. Thus, it is obvious, that as the shaft 55 rotates the pitman 53 will be reciprocated to transmit corresponding backward and forward reciprocation of the sets of fingers 44.

According to the present illustration, the guide 42 is shown as having two offset portions 43 and in advance of the second of these and above the conveyor there is arranged a plunger or ram. This element may include as in Fig. 9, a head 58 attached to a rod 59 slidably mounted in a bracket 60. In order to positively move the ram towards and away from the conveyor any suitable mechanism may be utilized such as shown by way of example in Fig. 9. According to this disclosure, a shaft 61 is mounted in the bracket 60 and a complementary support 60', being connected to the plunger rod 59 through a crank mounted on the shaft and a link pivoted to the crank and to the plunger rod 59. A second crank 62 is secured to the shaft 61 being pivoted to the end of a pitman 63, the opposite end of the latter terminating in a fork 64 straddling the shaft 55 and carrying a roller 65 riding within a cam track 66 formed in a cam member 66' carried by the said shaft 55.

From the foregoing it will be seen that the ram will periodically move towards and away from the conveyor and if open-mouthed packages filled with material are positioned upon the conveyor in proper relationship to the ram, the latter will serve to tamp and stow the contents of these packages upon their moving through the machine.

In operation, assuming that a number of packages are promiscuously placed upon the

conveyor 40, it will be seen that these packages by engagement with the offset portions 43 of the guides 41, will be caused to assume a position at an angle to the side edges of the conveyor and thus the foremost of these packages or articles will engage with the first offset portion 43 and be prevented from further movement with the conveyor, it being obvious that all packages following the one mentioned, will have their entrance into the machine blocked by this package and be prevented from further movement. The fingers 44 are then projected against the side face of the package moving it laterally so its forward right edge will clear the adjacent offset portion and consequently continue to move with the conveyor belt 40, so as to allow the next succeeding package to move into contact with the last mentioned offset portion. Due, however, to the fact that the offset portions 43 of the guide 41 are arranged in staggered relationship to the offset portions 43 of the guide 42, the article will again be diverted so that it will eventually move into contact with the second offset portion of the guide 42 and be restrained against further movement. Upon assuming this position, the ram provided by the head 58 is aligned with the open mouth of the receptacle and descends to enter the package through the same and to tamp the contents thereof in the event that the latter have not been previously properly stowed. Upon the ram being withdrawn, the fingers 44, which are adjacent the second offset portion 43 of the guide 42, are projected to permit the forward right hand edge of the package clearing this offset portion so that the same is free to continue its movement with the conveyor 40. Obviously, according to the construction depicted herewith, the projection of one set of fingers occurs simultaneously with the projection of the other set incident to the direct connection established by the shaft 51 and consequently upon the package moving beyond a position in line with the head 58, the package following which has been retained against movement by the first offset portion of the guide, is now brought to a position at which it may clear this offset portion and be moved by the conveyor to the next position at which the tamping operation may occur.

Hereinafter, the position at which the progress of the packages is initially impeded in order to properly space the same, will be referred to as station A, i. e., that portion of the mechanism adjacent to and in advance of the first offset portion 43 of the guide 42. The station at which the stowing of the contents occurs, i. e., that at which the package is in operative alignment with the plunger head, and adjacent to the second offset portion of the guideway, will be referred to as station B.

Article carriers and mechanism for transferring packages thereto (station C)

The package or other article which has been permitted to move beyond station B, will now be carried by the conveyor belt 40 to what may be conveniently termed the transfer station or station C, at which the package is removed from the conveyor belt and associated with the article platforms which carry the same through the succeeding mechanisms of the machine to the point at which it is finally sealed. These platforms, as in Figs. 1, 2, 3, 4 and 10, may each embrace a plate 67 carried upon a standard 68, which has its base suitably shaped for guidance by a fixed track 69 along which it may be moved by an endless chain 70, the latter conveniently passing over sprocket gears 71 carried one by the shaft 55 and the other by a shaft 72 mounted adjacent the opposite end of the machine. Upon the package reaching the transfer station, its progress may be interrupted by means of a stop 78 extending across the face of the conveyor belt 40. This stop in connection with a plunger 73 serves to further insure the proper spacing of the articles. The plunger 73 is projected and retracted by a link 74 and crank 75 which are in turn operated by suitable connecting members 76 moved by a cam 77 carried by the shaft 55. Upon the plunger 73 being retracted by means of the operating mechanism therefor, the article will move to a position at which it bears against the stop 78, in which position it will remain until the plunger is projected. The movements of the mechanism are so timed and correlated that this projection will occur when one of the article carriers is in proper position relative to the package and it is obvious that such projection will simply serve to transfer the article from the belt 40 to the platform 67 of one of the carriers. As shown in Fig. 10, the plunger 73 is partially retracted after the package P shown in dot and dash lines has been transferred.

This station has been termed station C and it must be borne in mind that the mechanism embraced within the same serves two purposes, viz, first, to again assure the proper spacing of the articles in reference to the positions occupied by the article carrying platforms which are relatively fixed one to the other, and second, to serve at the proper instant to efficiently transfer the article from the conveyor belt to the carrying mechanism which conducts the same through the rest of the machine. As shown in Figs. 36, 38 and 39, the conveyor belt 40, according to the construction shown in the present exemplification, passes over a pulley 79 carried by a shaft 80 arranged to the rear of station C and the conveyor returns adjacent the base of the machine, to its starting position (not shown).

Mouth spreading mechanism (station D)

After having been transferred to the platform plate 67 of the package carrier, the article is moved by the same to a point adjacent to a shaft 80' and, as may be seen, reference being had to Fig. 11, this shaft has affixed to it for rotation therewith a bracket 81 pivotally carrying a bellcrank 82 to one end of which a roller 83 is attached, the opposite end thereof being connected with a spring-pressed thrust rod 84 slidably attached to an extension 81' of the bracket 81, and pivotally secured at its outer end to the inner ends of a pair of links 85, which are in turn attached to spreader plates 86 having their inner ends pivotally secured as at 87 to the bracket extension. Mounted in stationary position adjacent to the bracket 81 and preferably encircling the shaft 80' is a cam 88, so that as the shaft 80' rotates the bracket 81, the crank 82 incident to the contact between the roller 83 and cam 88, will be rocked to project and retract the thrust rod 84 to move the spreader plates 86 to either of the positions indicated in full or dotted lines in Fig. 11; it being understood that the compression spring 84' serves at all times to press the roller 83 firmly against the cam 88 and tends to maintain the parts in the position indicated in dotted lines.

Thus, it will be understood that the shaft 80' rotates and the mechanism is so timed that the end of the bracket extension 81' projects into the open mouth of the liner or bag and between the flaps of the box as the latter reaches a position below the shaft 80'. In this connection it is of interest to note that the shaft 80' may be driven by mechanism serving to accelerate its rotation when the bracket extension is not projecting downwardly to thus allow of a maximum number of package carriers being used. Upon the parts assuming their downward position, the roller 83 will contact with the thrust portion of the cam 88 so as to project the rod 84 against the resistance of springs 84', thus moving the plates 86 to the position shown in full lines in Fig. 11 and consequently spreading the mouth of the liner and pressing the side flaps of the box outwardly.

Any suitable guiding means may be provided adjacent the bed of the machine to effectually prevent displacement of the package from the carrier platform 67 and as shown in Figs. 3, 10 and 14 this is accomplished by a pair of rails 89 and 90, arranged one to each side of the path of travel of the package carrying mechanism and it will thus be understood that as the spreader plates 86 act to distend the neck of the liner or bag, the flaps of the box will be engaged by the outer side faces of the liner and be bent downwardly towards these rails. Due to the fact that the shaft 80' rotates in such a direction that the spreader plates 86 will move arcuately in

the direction of feed of the package when coming adjacent thereto, there will be a period of travel during which the plates are in contact with the inner face of the liner and move with the package. Immediately beyond the point at which the spreader mechanism begins to move out of contact with the package, the rails 89 and 90 are provided at points above their bodies, with supplemental rails 91 and 92 as best shown in Figs. 13 and 14, it being observed that these supplemental rails have their forward ends inclined upwardly so that the forward edges of the flaps of the box, due to the aforescribed action of the spreader mechanism, are guided below the forward ends of the supplemental rails, and as the package continues the travel through the machine, the flaps are gradually bent downwardly to extend in planes substantially at right angles to the side walls of the package.

Now, in order to spread the forward flap of the box or package so it will not interfere with the succeeding operations of the mechanisms, it will be perceived that the bracket 81, as in Fig. 12, also carries a wiping member, in the present embodiment a hook 93, which is arranged in advance of the bracket extension 81' and consequently as indicated in dotted lines in the figure referred to, bears against the forward flap of the box as the same moves adjacent to the shaft 80' and swings this flap to extend at an angle to the vertical so that the flap is brought to a position at which it will not interfere with the subsequent manipulations to which the package is subjected.

The station at which the foregoing operations occur is identified as station D, and it will be borne in mind, reviewing the results achieved at this point, that the mouth of the liner is spread and the side flaps of the box are bent outwardly at an angle to enter under the rails 91 and 92 and be guided thereby, in the subsequent movement of the package, to lie substantially at right angles to the side walls of the package where they will not interfere with the operation of the mechanism which will be hereinafter described. Also, at this station, the forward flap of the box is bent to extend in advance of the package and all obstructions thereby avoided.

Flap bending and retaining mechanism (station E)

As has been brought out in the preceding chapter, the side flaps of the package are retained in position due to their sliding engagement with the under faces of the supplemental rails 91 and 92, but it will be appreciated that due to the inherent tendency of the forward flap to move to the position from which it has been displaced by the wiping member 93, means should usually be provided operating similarly to the rails 91 and 92 to also prevent a return of this flap. For this purpose, as in Fig. 3, a stub shaft 94 is arranged to the rear of the shaft 80' and is preferably driven thereby by any suitable mechanism such as a sprocket chain 95 which serves to synchronize the movements of these shafts. The shaft 94 of course moves in a suitable bearing as in Fig. 13 and as shown in this figure, this bearing preferably carries a cam 96. The shaft 94 is formed with a transversely extending opening 97 adjacent its end and a lever 98 of smaller diameter than the opening 97 extends through and beyond the same and is movably carried therein by means of a pin 99 secured to the shaft 94 and extending transversely of the opening 97 as well as in a direction at right angles to the axis of rotation of the shaft. The lever 98 has a roller 100 adjacent its shorter arm and this roller, by means of a compression spring 101, is at all times pressed into contact with the fixed cam 96.

Thus, as the shaft 94 rotates, the lever 98 will have the end of its longer arm moving in a circular path but upon reaching a position adjacent that shown in Fig. 13, this lever will be diverted from its true circular movement, incident to the fact that the thrust portion of the cam 96 will be engaged by the roller 100 associated with the shorter arm of this lever. Due to the fact that in such position the free end of the lever 98 is moving into engagement with the forward flap of the box P which is just being released by the wiping member 93, described in connection with the last station, the flap, incident to the continued forward movement, and as indicated in Fig. 12, will be subjected to continued downward swinging movement relative to the body of the package. Due to the disposition of the parts this movement may be continued until the flap, as a matter of fact, has been bent to a position slightly below a horizontal plane, and in order to retain it in its position, as in Figs. 10 and 14, a suitable restraining mechanism is provided.

This restraining mechanism, in the present instance, is provided by mounting a rotatable shaft 102 on the rear face of each of the standards 68 and spacing these standards in such a manner that the shaft carried by each standard lies adjacent to the forward edge of the package supported by the next succeeding carrier. A presser plate 103 is fixedly attached to the upper end of shaft 102 being disposed in position to overlie the flaps of the adjacent packages as the shaft is turned. However, a spring 104 exerts a turning influence on the shaft which normally results in the plate carried thereby occupying a position at which this co-operation will fail to occur, so that in all of the preceding stations through which the package has been moved, the plate will lie in what might be termed its inoperative position. The shaft 102 also carries an arm 105, mounting adjacent its outer end a

roller 106 and a cam in the nature of a rail 107, is provided adjacent the bed of the machine in order to co-operate with this roller to turn the shaft 102 and bring the plate 103 to a position at which it may co-operate with the flap of a box. Thus, reference being had to Fig. 14, as the article or package carrier reaches the station at which the forward flap of the box carried thereby will be engaged by the longer arm of the lever 98, the preceding carrier reaches the rear end of this station and accordingly, the plate 103 carried thereby is swung to flap engaging position so as to retain the flap as long as the shaft 102 is prevented from returning to its normal or inoperative position under the influence of the spring 104.

Thus, at this station, which is identified as station E, the forward flap of the box is swung outwardly and downwardly and before it is disengaged by the mechanism which accomplishes this result, it is prevented from return movement by the restraining action exerted by the plate 103.

Coupon inserting mechanism (station F)

In certain instances it is desired to introduce a coupon or label in the nature of a premium or advertisement into a package before the same is sealed and with this in mind, as shown in Fig. 3, there may be provided as a part of the present machine, a magazine 108 adapted to receive a stack of labels or coupons which are withdrawn by operating a discharging mechanism 109 of any desirable type, it being understood that a transfer mechanism, for example of the suction type, may be utilized to deposit one or more of the labels or similar articles within the package through the open mouth of the liner.

This station is conveniently identified as station F and it is obvious that although a mechanically operated discharging mechanism may be utilized for removing the labels from the magazine and that a pneumatic transfer mechanism may be employed for depositing the same within the package, that any desirable expedient may be resorted to for accomplishing this purpose.

Liner folding mechanism (station G)

It will be understood that the package upon leaving station E has its parts disposed so that the forward and side flaps of the box extend substantially at right angles to the side walls thereof, while the mouth of the liner extends substantially parallel to the side walls. Now, in order to effectually seal this liner which, as aforesaid, may be of a material impervious to air, moisture, etc., it is preferred, according to the herein disclosed embodiment of the invention, to form bellows folds in the forward and rear edges of the liner as shown in Fig. 16.

The mechanism for accomplishing this result is shown to best advantage in Figs. 4 and 15. In these views it will be noted that a cross bar 110 is mounted on the frame of the machine and carries brackets 111 and 112. Mounted upon a shaft 113 carried by the brackets 111 are arms 114 and 115, and motion is imparted to the first of these arms by the medium of a further arm 116 attached to the shaft 113 and which arm carries a link 117 supporting a roller 118 and a fork 119. The latter straddles a drive shaft 120 carrying a cam track member 121 and the roller 118 rides within the track thereof so that upon the shaft 120 being rotated, the link 117 will be reciprocated to rock the arm 116 and consequently the shaft 113, and arm 114. The arm 115 which is rotatably carried by the shaft 113 may be similarly moved by a cam mechanism 115'. Rockingly carried by the bracket 112, which extends in a direction parallel to the path of travel of the articles through the machine, are folding arms 122 and 123, and these arms are connected respectively with the arms 114 and 115 by means of links 124. Thus, upon a package coming to lie below the folding arms and the cams operating to move the arms 114 and 115, the folding arms 122 and 123 which will then be lying adjacent to the forward and rear edges of the liner, will be snapped downwardly and inwardly to thus form bellows folds in these edges of the liner or bag.

It will be appreciated that in certain instances, the rear flap of the box might occupy such a position as to interfere with the operation of the arm 123 and with this in mind, there has been provided a mechanism which serves to prevent the occurrence of this difficulty.

In the present instance this mechanism embraces a standard 125, (Figs. 17 and 18) which has its upper end terminating adjacent the plane occupied by the flap in question and which may be attached to the base of the machine. This standard supports a rotatable shaft 126 carrying a finger 127 and also attached to this shaft is an arm 128 formed with a pair of spaced lugs between which one end of a lever 129 extends, the opposite end of this lever being rockingly supported by the shaft 113. The lever 129 carries a fork 130 straddling the shaft 120 and furthermore supports a roller 131 having engagement with a cam track formed in a member 132 which is supported upon the shaft in question.

Thus the shaft 126 is periodically rocked to oscillate the finger 127 and due to the fact that the latter lies and has its path of travel in a plane into which the outer end of the rear flap of the box is to be disposed and furthermore due to the fact that this finger is positioned at a point to the rear of the mechanism acting to provide the bellows fold, the flap in question will be snapped back for a short

period of time so that it cannot obstruct the operations of the bellows folding members.

The mechanism included in this chapter is that embraced in station G and in review it will be borne in mind that at this station the rear flap of the carton is moved to a point at which it will not obstruct the operation of the folding arms 122 and 123 and at this station these folding arms serve to provide the bellows fold desired.

Bag sealing mechanism (station H)

With reference to this mechanism, particular attention is invited to Figs. 4, 19 and 20. In these figures a pair of opposed pressing irons 133 and 134 are shown and one of these irons may carry a suitably resistance unit adapted to be connected to a source of electrical energy by means of leads 135, in order to heat the iron.

With a view of properly moving these irons into pressing engagement with the bag or liner adjacent the mouth thereof, and maintaining contact for a sufficient length of time to assure adhesion of the parts, it will be observed that each of the irons is secured to a carriage 136 slidably mounted upon rods 137 extending parallel to the direction of travel of the packages. These rods in turn form a part of a table 138 which is mounted for movement transversely of the direction of travel of the packages by virtue of the fact that it is slidably supported upon rods 139 extending transversely of the machine body. A rack 140 is attached to the carriage 136 and is adapted to have its teeth mesh with the teeth of a pinion 141, carried by a block 142 which is slidably supported by rods 142' upon the table 138, and a further rack 143 is affixed to the table and also has its teeth in mesh with the pinion 141 for a purpose hereinafter brought out. As will be observed, similar mechanism is associated with the second presser iron and each of the blocks 142 is attached by link connections 144 to a shaft 145, the latter being oscillated by a thrust rod 146 actuated by a cam 147 which is carried by a drive shaft 148. Thus, upon the shaft 145 being rocked, the blocks 142 will be reciprocated and incident to the fact that the latter each carry a pinion meshing with the fixed rack as well as with the longitudinally movable rack 140, it will be obvious that these carriages will be moved longitudinally of the machine or, in other words, in the direction of travel of the packages. Connected with each of the tables 138 by links 149' is a crank arm 149, the movements of the latter being synchronized by a rod 150 having its ends connected to arms 151, attached to stub shafts 152 to which the arms 149 are secured. One of these stub shafts also carries a segmentary rack 153, the teeth of which mesh with the corresponding teeth of a rack 154 mounted for reciprocating movement and adapted to be so

reciprocated by a cam 155 connecting the same with the drive shaft 148.

Thus, the presser irons 133 and 134 are moved towards each other and consequently engage the mouth of the bag as in Fig. 20, to press the inner faces of this member into intimate contact and under the action of heat, to cause the wax-like substance with which the same is preferably impregnated, to become sufficiently fluid to insure adhesion of the engaging surfaces. Due to the fact that this adhesion usually necessitates more than an instantaneous application of the heated iron, the latter will now move with the package as the same is conveyed by the package carrier, it being observed that the mechanism is so timed that this movement will be such that no relative movement will occur between the irons and the package during this operation. In this connection it is to be noted that the movements of the irons are synchronized first in lateral reciprocation due to the provision of the rod 150 connected with both irons, and furthermore in longitudinal reciprocation due to the fact that the blocks 142 are each connected to a common shaft 145. This longitudinal movement in unison with the movement of the package, is caused, as will be perceived, by the movements of the blocks 142, and upon the package reaching the end of the station at which sufficient time will have elapsed to accomplish the desired adhesion of the inner surfaces, the cranks 149 will retract the tables 138 and consequently the carriages 136 and the presser irons carried thereby, so that the latter will move out of contact with the outer faces of the liner. In order to return the presser irons to their initial position, i. e., that shown in Fig. 4, the blocks 142 will now be moved towards the front end of the machine with a relatively rapid motion, this being caused by the cam 147 and the mechanism connecting the latter with the blocks. In such movement it is obvious that the carriages 136 will be rapidly moved and due to the mechanism provided, this movement will be double that of the speed of movement of the blocks.

Thus, at station H a package is presented in which the flaps of the box, with the exception of the rearmost one, are all retained in a position substantially at right angles to the side faces thereof and the bag or liner has its front and rear edge portions formed with bellows folds, the neck of this bag extending upwardly beyond the upper edges of the box. The irons 133 and 134 move towards each other incident to the action of the arms 149, which due to their movement and being connected with the tables 138 move the latter over the rods 139. The neck of the liner will be pinched together as has been described in connection with Fig. 20, and under the influence of the heat to which this

portion is subjected, the wax like substance will be caused to become fluid. The clamping tendency will be continued due to the fact that the carriages 136 will be moved along the rods 137 carried by the tables 138, this movement being caused by the corresponding movements of the blocks 142. Under such continuance of pressure and application of heat, the inner faces of the liner will adhere and the irons then will move apart and be quickly returned to their initial position. It is of interest to note that if a safeguard is desired to prevent any damage occurring to this mechanism, in the event of a deformed package being operated on by the same, the rod 150 may be composed of a pair of sections yieldingly held in proper relationship to each other. Thus, if the irons are prevented from moving to their proper position, the yielding connection indicated at 156 will prevent damage to the operating connections.

*Bag cooling and pressing mechanism
(station I)*

Reference being had to Figs. 4, 5, and 21, it will be observed that a pair of endless link chains 157, 158 are mounted with the inner face of one spaced from the inner face of the other, the space between the same being just sufficient to permit the compressed neck of the liner to be introduced therebetween. These chains are preferably of the open link variety so that air may freely circulate through their bodies to permit of the cooling of the heated adhering surfaces of the liner neck although continuing to press these surfaces into intimate contact. The chains may each conveniently pass around suitably interconnected rollers 159 mounted upon stub shafts 160 and one of these shafts carries a bevelled gear 161 engaging a similar gear mounted upon a shaft 162 driven by a power transmission 163 connected with the drive shaft 148.

At station I it will thus be seen that the sealed neck of the liner immediately upon its being released from the clamping and heating mechanism, will be engaged by the chains to thus continue the pressing operation to insure the permanency of the adhesion and to allow for gradual cooling of the surfaces affected, and it will be observed that in order to expedite this cooling, a pipe line 164 may be associated with this station and serve to direct a current of air against the heated surfaces of the package.

Bag tucking mechanism (station J)

Positioned above the frame, at a point to the rear of the bag cooling and pressing mechanism is a shaft 165 (see Figs. 5 and 22) which serves by means of suitable gears to drive a shaft 166. This shaft is mounted upon a bearing secured to a bracket 167 and affixed to the bearing is a cam member 168' presenting

a cam track 168, within which a roller 169 is movable. A carriage 170 is mounted for movement in the direction of travel of the packages by means of rods 171 upon which it rides and this carriage mounts, by means of a suitable guideway, a slide 172 carrying at its outer end the tucking mechanism, and mounting the roller 169. Attached to the shaft 166 (Figs. 22 and 25) and extending below the cam track is a crank 173 formed with a longitudinally extending slot 174 through which the roller 169 projects into the cam track 168. Thus, upon the shaft 166 being rotated by the shaft 165, the roller 169 will be moved through a circuitous path by means of the crank 173, but due to the opening 174 in the latter, this path will not be a true circle, but will follow the configuration of the track 168. This will result in the carriage 170 being reciprocated along the rods 171 and in the slide 172 being projected and retracted transversely to carriage movement. The tucking mechanism which is attached to the outer end of the slide, as in Figs. 22, 23 and 24, embraces a plate 175 presenting a resilient presser portion 176. This plate is mounted upon a bracket 177 depending from the slide 172, and the outer end of the former is retained in elevated position due to the provision of a spring 178 which has one of its ends pressing against a portion of the plate which is extended beyond the point of pivotal mounting thereof, its opposite end engaging a fixed portion of the bracket. A link 179 is connected to a lug extending from the plate 175 and is also attached to the end of a bellcrank lever 180, carried by the bracket 177, the opposite end of this bellcrank lever carrying a roller, and being adapted for engagement with a cam surface, 181.

Thus, the neck of the liner being in the position indicated in full lines in Fig. 22, it will be apparent, assuming the mechanism to be properly timed, that upon the package reaching a position adjacent to the tucker, the plate 175 thereof will move inwardly to bend the flap to the position shown in dotted lines in the figure last mentioned, and the plate 175 after bending the neck over will move downwardly and thence out of contact with the same so that the neck of the liner remains in the position indicated in full lines in Fig. 23. At this station, which is known as J, the sealed mouth of the bag or liner is folded over so that the same lies wholly within the body of the box and it will be observed, that this action of the parts is so positive that reliance may be placed upon the desired result being achieved.

Flap releasing mechanism (station K)

The function and construction of the mechanism at station K according to the present embodiment will be seen to include the discontinuance of the cam provided by the rail 107,

thus allowing the shaft 102 to be turned due to the thrust exerted by the spring 104 so as to again shift the flap-holding finger 103 to its inoperative position, whereby to free the forward flap of the box, which has until this time been prevented from following its normal tendency to move upwardly. From station K, the package moves with both front and rear flaps released from any restraining influence, the side flaps being however, restrained.

Front and rear flap folding mechanism (station L)

Located immediately to the rear of station K, as shown in Figs. 5, 6, and 26, is a bracket 182 which carries a slidable rack 183, the teeth of which mesh with an arcuate rack 184 mounted upon a shaft 185 directly supported by the bracket. This shaft has a further arcuate rack 186 meshing with a similar member 187 carried by a counter-shaft 188. The bracket 182 has an extension 182' immediately above the upper edge of the box or carton P carrying adjacent to the latter a plate 189 having an upturned forward end 190. A tucking finger 191 is attached to the arcuate rack 187 and extends into the plane of the lower face of the plate 189. The shaft 165 carries a cam track member 193' having a cam track 193a and a roller 193 extends into this track and is mounted upon a fork 194 of a thrust rod which is connected with the rack 183. Thus, as the shaft 165 rotates the cam will cause a reciprocation of the rack 183 and a consequent oscillation of the shafts 185 and 188. This will result in a rapid movement on the part of the tucking finger 191 which will swing towards and away from the plate 189.

Thus, as the package is moved by the carrier to a point beyond the plate 189 and the forward flap is folded over by the upturned portion 190 of this plate and brought to the position shown in Fig. 26, the tucking finger 191 will swing rapidly to overtake the rear flap of the box and to fold the same inwardly and downwardly so that what is now the forward edge thereof will be tucked sufficiently under the upturned portion 190 of the plate to permit the body of the latter to press this flap to the position also shown in Fig. 26.

In other words, at station L, both the front and rear flaps of the package are bent inwardly and downwardly to occupy a position above the neck of the liner which has been tucked into the body of the box.

Glue applying station M

The supplemental rail 92 which has been holding one of the side flaps at right angles to the side walls of the package is discontinued adjacent station L and to one side of this station is station M. Thus, at this station the side flap is released and in the fur-

ther movement of the package this flap passes between gluing rollers. As shown in Figs. 6, 27, 28, 29 and 30, there is involved in this station an adhesive bath 195 within which a coating roller 196 is partially immersed, a scraper 197 co-operating with this roller to remove any excess of adhesive which may tend to adhere to the face thereof. Mounted above the roller 196 is a co-operating roller 198 and as clearly shown in Figs. 6 and 28, these rollers may be driven by suitable mechanism, which in the present instance includes a sprocket chain 199, driven through a shaft carrying driving gears 200 and 201 of different diameters. In mesh with these gears are mutilated gears 202 and 203 mounted upon an idler shaft which is connected in any suitable manner such as at 204 to one of the drive shafts of the machine. Thus it will be seen that the gluing rollers may be given a peripheral velocity equal to the velocity of the package as the flap of the latter is brought between the same. Immediately subsequent to the flap passing beyond this station, however, the action of the rollers will be speeded up by action of the cooperating mutilated gears as shown in Fig. 28 so as to assure a sufficient coating of adhesive, and this accelerated operation will continue until a succeeding package flap is about to enter between the glue applying rollers when normal speed will be resumed. As shown in Fig. 29, the upper roller 198 may be spring-pressed against the lower roller 196 and thus adhesive will also be applied to this upper roller and consequently due to the fact that the contacting roller faces are arranged to one side of the path of travel of the package, one side flap, as in Fig. 30, will pass between the rollers and consequently have both its upper and lower faces coated with glue.

Beginning adjacent this station, and as in Figs. 6, 7 and 36, the supplemental rail 91 is discontinued and the rail 89 is continued in the form of a shield 205 which is gradually curved so that as the package moves forward, the flap previously restrained from movement by means of this supplemental rail, will be positively and slowly turned over to a position at which it will extend above the upper edge of the side walls of the package.

Thus, at station M, both of the side flaps are released but before one of the same may move upwardly incident to its inherent tendency to do so, glue is applied to both faces thereof while the opposite flap is slowly brought to extend upwardly.

Sealing and expelling (station N)

Reference being particularly had to Figs. 6, 7, 31, 32 and 33, it will be noted that there is mounted a guide 206 immediately succeeding station M, which guide acts to turn the glued flap to extend upwardly and inwardly with respect to the package. The frame of

the machine supports rods 207 upon a bracket 208 and these rods serve to slidably support a carriage 209 carrying rods 210 extending at right angles to the rods 207, and the rods 210 slidably carry a block 211. This block as best shown in Figs. 6 and 7 supports a pinion 212 having its teeth in mesh with the teeth of a rack 213 affixed to the carriage 209, and the teeth of the pinion also engage the teeth of a further rack 214 secured to table 215 movable along rods 216 which are also supported by the carriage 209. Affixed to the table 215 is a plunger bracket 217 carrying adjacent its upper end a spring-pressed fork 218, which supports a roller 219, the latter being disposed in a plane just above that occupied by the upper edges of the packages. A cam 220 is secured to a fixed portion of the machine (see Figs. 6, 7, 32 and 33) and is disposed adjacent to the fork 218 so that a roller 220' associated with the latter, may be engaged by the edges of the cam. A crank 221 is attached to the carriage 209 and moves the same laterally towards and away from the bed of the machine. This crank is rocked by suitable mechanism shown to best advantage in Figs. 6 and 34. A shaft 222 carries this crank and has attached to it an arcuate rack 223 which moves with a reciprocatory rack 224, the teeth of these two racks being pressed into engagement with each other by means of a guide roller 225, it being understood that the rack 224 is projected and retracted preferably by a suitable cam mechanism (not shown), such as that shown at 168' in Figs. 5 and 22. The block 211 is also moved by suitable pitman mechanism 226 in a direction at right angles to the movement of the carriage. Thus it will be obvious that upon the block being reciprocated along the guide rods 210 upon which it is mounted, the table 215 will also be correspondingly moved to convey the plunger bracket 217 and the mechanism carried thereby in a certain predetermined path.

The guide or shield 205 is continued, as shown in Figs. 6, 7 and 36, to a point adjacent the roller 219, but at this point, has its lower portion bent rearwardly and downwardly as at 227 to assume a more gradual degree of inclination than the body of the shield. To the rear of this portion there is provided a bed for the reception of packages or cartons from the carrier, generally indicated at 228. This bed includes a platform 229 and a series of rollers 230, the side walls of the bed being bounded on one hand by guide strips 231 and on the other hand by a spring-pressed, rockingly mounted baffle 232, and at one end of the bed thus provided, the plunger bracket 217 is positioned, while a movable conveyor 233 is disposed adjacent the delivery or outer end thereof.

Thus, as the package moves towards station N, the unglued flap of the same continues its inward and downward movement by opera-

tion of the shield 205 and the glued flap moves in a similar manner, due to the action of guide 206. Upon the package reaching a position adjacent to the cam roller 220', the latter will be moved by action of the block 211 to a position at which it will clear the end of the cam 220. Upon the fork 218 being released from the restraining influence exerted by the cam 220, the roller 219 due to the bias of springs 219' will snap forwardly into contact with the upper face of the glued flap and press its inner face against the upper faces of the front and rear edge flaps of the box, thus causing initial adhesion of these parts. Immediately succeeding this operation, the carriage 209 will move inwardly so that the plunger face of the bracket 217 will move into contact with the side face of the box and thrust the same laterally from the conveyor towards the bed 228. In such movement, the unglued side flap of the box will be wiped by the bent portion 227 of the guide 205 so that the inner face of this flap will come into contact with the upper or glued face of the opposite side flap to effect initial adherence, and complete adhesion of the parts will be assured by the rollers 230 which now press against the outer face of the uppermost side flap. In this connection, it is of interest to note, reference being had to Fig. 35, that each of the rollers 230 may be mounted upon the frame of the machine by means of eccentric bushings 234 so that these rollers may be adjusted to occupy a position so the degree of pressure exerted by the same upon the upper face of the outermost flap will be just sufficient to cause firm contact but to prevent any crushing of the package. The purpose of the baffle 232 is to avoid damage to the machine or packages in case of possible jamming of the latter. Should a jam occur the spring mounting of the baffle would allow the latter to give and the jamming packages to be crowded clear of the bed.

Also, due to the fact that the table 215 and the bracket 217 carried thereby are mounted for sidewise as well as for inward movement, the plunger provided by the bracket will move with the package not only in the direction of transference to the bed 228, but also in the direction of movement of the package carrier. It will be obvious that as the transference of the article to the bed 228 is completed, the mechanism designated by the numerals 221 to 226 inclusive, will quickly return all of the parts of the final sealing and expelling mechanism to initial position ready for co-operation with the next succeeding package. When return of the parts to initial position is thus effected, it will be seen, referring to Fig. 7 that the cam roller 220' will then lie in position, due to the projection of the plunger bracket 217, to pass inside the came 220, interference by the latter being thus avoided. When roller 220' has passed

beyond the cam 220, the plunger bracket 217 may then be withdrawn to initial position adjacent the nose of the cam.

Résumé

Thus, it will be understood in the present embodiment, that a machine is provided consisting of a number of units each of which performs the operations required. The machine receives, as has been previously brought out, a box or carton having its lower end sealed and containing a liner in turn filled with the material to be packaged and the mouth of the liner or bag and the flaps of the box as received by the machine, extend upwardly.

The initial function of the apparatus at the first station (A) is to prevent more than one box or carton entering the machine at a time. At the next station (B) the material is stowed or arranged within the bag or liner, and mechanism acts to subsequently move the carton further into the body of the machine and to allow succeeding cartons to be introduced at station A, and from station A to station B.

At the next station (C) transfer mechanism operates to transfer the package or carton to a carrier provided therefor, this mechanism operating to effect such transfer only at a time when the carrier is ready to receive the package. This carrier is operated to advance the packages in the machine, during which advancement, the successive operations are performed thereon. The package then moves to station D at which the mouth of the liner is spread and the side flaps are brought to a position to be engaged by restraining mechanism preventing their interference with further manipulations to which the parts of the package are subjected, it being observed that at this station, the front edge flap of the box is also caused to assume a non-obstructing position.

At the next following station (E) the front flap of the box is engaged by restraining mechanism and to effectually hold it against further movement relative to the body of the package, and at station F a coupon may be deposited in the package if it is so desired.

The rear flap of the carton which up to this time has been unrestrained by the mechanism is then moved at the next station (G) to a position to permit folding mechanism to operate on the walls of the liner mouth to form bellows folds therein. At the next succeeding station (H), these bellows folds and the opposite walls of the liner are pressed into contact with each other by suitable mechanism and heat may be simultaneously applied to sufficiently soften the wax-like or similar substance with which the liner walls are treated, to effect adherence of the folds and liner walls thus accomplishing an effectual seal.

At the next station (I), the seal is made secure by mechanism which holds the engaging surface in intimate contact while cooling of the wax-like substance takes place preferably during application of a cooling agency, thus setting the seal while under pressure so as to form a joint which will thoroughly exclude moisture and other foreign matter. At the following station (J) the sealed mouth of the liner is tucked over to occupy a position within the body of the carton. At this point in the operation, mechanism is provided at the next station (K) for releasing the front flap of the carton, which has previously been restrained, and then as the carton is advanced in the machine, this flap is slowly folded over upon the mouth of the liner (station L), while the rear flap is also folded over by a properly timed mechanism to occupy a complementary closing position on the carton.

At the next station (M) an adhesive is applied to one of the side flaps of the box while the other flap continues to be slowly folded over and in moving to the next station (N), the adhesive coated flap is also folded over so it may be moved to engage the underlying front and rear flaps of the box and to be in turn engaged by the inner face of the opposite side flap which at this station is moved to overlying position and pressed into intimate contact with the glue coated flap. Mechanism is also provided at this point which permits an interval of time to elapse before the package is completely expelled from the machine during which the adhering surfaces are firmly pressed together and the adhesive sufficiently coagulates to assure the permanency of the restraining influence exerted thereby and the article then moves to the conveyor from which it is finally delivered from the machine.

In Fig. 37, the disposition of the package parts relative one to the other, at the various stations has been illustrated. Thus, the package at the left in the upper row has its parts disposed in this position while at stations A, B and C. The next illustration to the right shows the disposition of the package parts in stations D, E, and F, and the position at station G is shown in the next succeeding view.

The article as at stations H and I is next shown while the illustration at the left end of the bottom row shows the position of the parts at stations J and K.

The succeeding view illustrates the position of the package parts at station L and the application of glue occurring at station M to one of the side flaps as well as the initial turning over of the other of the same has also been indicated in this view.

The next illustration shows the package as at station N after the roller has operated and the expelling action has begun, while the final position assumed by the parts in station

N has been shown in the next succeeding illustration.

Furthermore, for the sake of clarifying the disclosure of the construction utilized, there is shown in Figs. 36, 38, 39 and 40, diagrammatic illustrations of the driving mechanism and it will be observed in these views, that it is preferred to utilize a single driving unit such as a motor 235, which is connected with a series of drive shafts arranged at suitable intervals throughout the machine which shafts in turn serve to drive the various units of the mechanism.

While the disclosure herein relates to a machine including a certain arrangement and construction of units particularly adapted for operation upon cartons or boxes of the type designated, it is to be understood that without departing from the scope and spirit of the present invention, other articles might be satisfactorily operated on by the machine and that the arrangement of the units thereof might be materially altered and that the construction of the same might be changed in numerous particulars according to the operations for which the machine may be particularly designed.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. A device of the character described, including in combination, means for receiving a package having flaps adjacent its upper edges and means for retaining the flap adjacent the front edge of the package at an angle to the edge face thereof.

2. A device of the character described, including in combination, means for receiving a package having flaps adjacent its upper edges and means for retaining the majority of said flaps at an angle to those faces of the package of which they form a continuation.

3. A device of the character described, including in combination, means for receiving a package having flaps adjacent its upper edges and means for retaining the flaps affixed to the side and front edges of the packages at an angle to those faces of the package of which they form continuations.

4. A device of the character described, in-

cluding in combination, means adapted to receive a bag having a mouth and means traveling with the bag for pressing the inner faces of the mouth into intimate contact with each other for sealing the same.

5. A device of the character described, including in combination, means adapted to receive a bag having a mouth sealed under the action of heat and presser means for exerting pressure upon such bag and cooling the heated surfaces thereof whereby to insure the permanency of the adhesion.

6. A device of the character described, including in combination, means adapted to carry packages having flaps adjacent their upper edges and a bag having its mouth extending beyond the body of the package, means for retaining such flaps in positions at which they extend outwardly from such packages and means for forming bellows folds in the mouth of said bag.

7. A device of the character described, including in combination, means adapted to carry packages having flaps adjacent their upper edges and a bag having its mouth extending beyond the body of the package, means for retaining such flaps in positions at which they extend outwardly from such packages and means for forming bellows folds in the front and rear edges of the bag mouth.

8. A device of the character described, including in combination, means adapted to carry packages having flaps adjacent their upper edges and a bag having its mouth extending beyond the body of the package, means for retaining such flaps in positions at which they extend outwardly from such packages and means for forming bellows folds in opposite edges of the bag mouth.

9. A device of the character described, including in combination, means adapted to carry a bag having a mouth, means for applying pressure to the latter portion to seal the same and means for folding the sealed mouth.

10. A device of the character described, including in combination, means adapted to carry a bag having a mouth, means for applying pressure to the latter portion to seal the same and means for folding the sealed mouth upon the body of the bag.

11. A device of the character described, including in combination, means adapted to carry a package having flaps adjacent its upper side edges, one of said flaps being folded inwardly upon the top of such package, the other of the same extending in a plane above said last named flap, means for expelling such package from the carrying means therefor and in such expelling to bring the last named flap into intimate contact with said first named flap.

12. A device of the character described, including in combination, means adapted to

convey a package having an open mouth portion and being filled with a material adapted to be packaged, means arranged adjacent said conveyor and movable relative thereto for entering the mouth of said package and properly stowing the material within the body of the same, means providing a stop for said package and acting to prevent a movement of the same during such stowing operation and means operating subsequent to said last named operation for releasing the package from said holding means.

13. A device of the character described, including in combination, means adapted to convey packages having open mouths and containing material, a plurality of package stopping means adjacent said conveying means, means adapted to enter the mouth of one of said packages and acting to properly stow the material within the same while said package is engaged by one of said stops and means acting subsequently to release said package from said stop and to also release a succeeding package from a stop which it engages whereby to permit the first named package to move to a point beyond said stowing means to permit the succeeding package to move to a point adjacent said stowing means.

14. A device of the character described, including in combination, a plurality of means each adapted to carry packages having flaps and means associated with each of such package carrying means and engaging the flap associated with the body of the package supported by the next adjacent carrier for preventing a movement of said flap relative to said body.

15. A device of the character described, including in combination, a plurality of means each adapted to carry packages having flaps and means associated with the rear portion of said package carrying means and adapted to engage the flap of the package supported by the next succeeding package carrier whereby to normally prevent a movement of said flap to the package body.

16. A device of the character described, including in combination, movable means adapted to carry a package having an open mouth, means for subjecting such mouth to pressure to close the same, said pressing means moving with the mouth of said package, means for disengaging such pressing means from said package and means subsequently engaging the pressed portions of said package and continuing the pressure upon the same to insure of a continued intimate contact being effected between the pressed surfaces.

17. A device of the character described, including in combination, movable means adapted to carry a package having an open mouth, means for subjecting such mouth to pressure to close the same, means for disen-

gaging such pressing means from said package and means moving with said package and engaging the pressed portions of said package and continuing the pressure upon the same to insure of a continued intimate contact being effected between the pressed surfaces.

18. A device of the character described, including in combination, movable means adapted to carry a package having an open mouth, means for subjecting such mouth to pressure to close the same, said pressing means moving with the mouth of said package, means for disengaging such pressing means from said package and means moving with said package and engaging the pressed portions of said package and continuing the pressure upon the same to insure of a continued intimate contact being effected between the pressed surfaces.

19. A device of the character described, including in combination, movable means adapted to convey a package having an open mouth and being formed with a material treated with a waxlike substance, heated means adapted to engage the portions of such package adjacent said mouth for pressing the same together and to cause a softening of said substance resulting in an adhesion of the inner faces of said package and cooling means adapted to engage the mouth of the package subsequent to the release thereof from said pressing means, whereby to cool the heated surfaces and to assure the permanency of the adhesion.

20. A device of the character described, including in combination, movable means adapted to convey a package having an open mouth and being formed with a material treated with a waxlike substance, heated means movable with said package and adapted to engage the portions of such package adjacent said mouth for pressing the same together and to cause a softening of said substance resulting in an adhesion of the inner faces of said package and cooling means adapted to engage the mouth of the package subsequent to the release thereof from said pressing means, whereby to cool the heated surfaces and to assure the permanency of the adhesion.

21. A device of the character described, including in combination, movable means adapted to convey a package having an open mouth and being formed with a material treated with a waxlike substance, heated means adapted to engage the portions of such package adjacent said mouth for pressing the same together and to cause a softening of said substance resulting in an adhesion of the inner faces of said package and cooling means movable with said package and adapted to engage the mouth of the package subsequent to the release thereof from said pressing means, whereby to cool the heated surfaces

and to assure the permanency of the adhesion.

22. A device of the character described, including in combination, movable means adapted to convey a package having an open mouth and being formed with a material treated with a waxlike substance, heated means movable with said package and adapted to engage the portions of such package adjacent said mouth for pressing the same together and to cause a softening of said substance resulting in an adhesion of the inner faces of said package and cooling means also movable with said package and adapted to engage the mouth of the package subsequent to the release thereof from said pressing means, whereby to cool the heated surfaces and to assure the permanency of the adhesion.

23. A device of the character described, including in combination, movable means adapted to carry a package having a closed mouth and means moving with the package and adapted to fold the portions adjacent the mouth thereof.

24. A device of the character described, including in combination, movable means adapted to carry a package having a closed mouth and means moving with the package and adapted to fold the portions adjacent the mouth thereof and into the body of the package.

25. A device of the character described, including in combination, movable means adapted to carry a package embracing an outer portion having an open mouth and a bag having a closed mouth extending beyond the body of the outer portion, means adapted to tuck the closed portions of the bag adjacent the mouth thereof into the body of the package and means for causing said last named means to move with said bags.

26. A device of the character described, including means adapted to carry a package embracing a box having flaps adjacent its upper edges and a material containing bag disposed within the body of the box and having an open mouth extending above the edges thereof, means for moving certain of the flaps of the box to extend at angles to the body thereof, means for sealing the mouth of the bag, means for tucking such mouth into the body of the box, means for subsequently folding the flaps of the box to overlie the bag and means assuring the retention of the flaps in such position.

27. In a machine for packaging material in a carton having a liner treated with a waxlike substance including in combination, means for pressing the walls of the liner together adjacent the mouth to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for subsequently closing the carton flaps over the closed liner, and means for holding the flaps

in non-obstructing position during operation of the liner closing means.

28. In a machine for packaging material in cartons, including liners treated with a waxlike substance, including in combination, means for pressing the walls of each liner together adjacent the mouth thereof to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for subsequently closing the carton flaps over the liner, means for advancing the cartons successively to the different operating mechanisms, and means for holding the carton flaps in non-obstructing position during carton feed and operation of the liner closing mechanism.

29. In a machine for packaging material in cartons, including liners treated with a waxlike substance, including in combination, means for pressing the walls of each liner together adjacent the mouth thereof to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for subsequently closing the carton flaps over the liner and sealing them in closed position, means for advancing the cartons successively to the different operating mechanisms, and means for holding the carton flaps in non-obstructing position during carton feed and operation of the liner closing mechanism.

30. In a machine for packaging material in a carton having a liner treated with a waxlike substance, including in combination, means for pressing the walls of the liner together adjacent the mouth to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for folding over the closed liner mouth in the carton, and means for subsequently closing the carton flaps over the closed liner.

31. In a machine for packaging material in a carton having a liner treated with a waxlike substance, including in combination, means for pressing the walls of the liner together adjacent the mouth to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for applying pressure to the closed liner mouth in the presence of a cooling medium after the application of heat thereto, and means for subsequently closing the carton flaps over the closed liner.

32. In a machine for packaging material in a carton having a liner treated with a waxlike substance, including in combination, means for pressing the walls of the liner together adjacent the mouth to close the same while applying heat to soften the waxlike substance thereby to effect a seal, means for folding over the closed liner mouth in the carton, means for applying pressure to the closed liner mouth in the presence of a cooling medium after the application of heat

thereto, and means for subsequently closing the carton flaps over the closed liner.

33. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, and means for subsequently closing the carton upon the closed liner.

34. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for folding over the closed mouth of the liner in the carton, and means for subsequently closing the carton upon the closed liner.

35. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, and means for continuing pressure on the closed liner mouth in the presence of a cooling agency to assure permanency of adhesion.

36. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for continuing pressure on the closed liner mouth in the presence of a cooling agency to assure permanency of adhesion, and means for subsequently closing the carton upon the closed liner.

37. In a machine for packaging material in a carton including a liner treated with a waxlike substance, including in combination, means for automatically advancing the cartons successively to mechanisms for performing different operations thereon, means advancing with the advancing cartons for pressing the walls of the liner together adjacent the mouth to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, and means for closing the carton flaps over the closed liner.

38. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination,

means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for subsequently closing the carton upon the closed liner, means for automatically advancing the cartons to the mechanisms for performing different operations thereon, said liner closing means during closing operation thereof advancing with the advancing carton.

39. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for folding over the closed mouth of the liner in the carton, means for subsequently closing the carton upon the closed liner, means for automatically advancing the cartons to the mechanisms for performing different operations thereon, said liner closing means during closing operation thereof advancing with the advancing carton.

40. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for continuing pressure on the closed liner mouth in the presence of a cooling agency to assure permanency of adhesion, and means for automatically advancing the cartons to the mechanisms for performing different operations thereon, said liner closing means during closing operation thereof advancing with the advancing carton.

41. In a machine for packaging material in cartons with open-mouth liners treated with a waxlike substance, including in combination, means for pressing the opposing walls adjacent the open mouth of the liners toward each other to close the liner while applying heat to effect softening of the waxlike substance thereby to effect adhesion of the liner walls, means for continuing pressure on the closed liner mouth in the presence of a cooling agency to assure permanency of adhesion, means for subsequently closing the carton upon the closed liner, and means for automatically advancing the cartons to the mechanisms for performing different operations thereon, said liner closing means during closing operation thereof advancing with the advancing carton.

42. A device of the character described, including in combination means to convey a carton having a liner, means to spread the

- flaps at an open end of the carton outwardly and downwardly, means to place advertising matter in said liner, means to fold and seal said liner, means to move one of said flaps out of the path of operation of said folding means and means to close said flaps over the opening and seal the same, the several means acting successively during conveyance of the carton.
43. A device of the character described, including in combination, means adapted to carry a package having an open mouth, flaps adjacent thereto, and a liner within the body of said package and having its mouth extending above the upper edge thereof, means adapted to enter the mouth of the liner and spread the same, thereby to bring pressure to bear against the inner faces of certain of said flaps and spread said flaps, and means to engage the inner face of another of said flaps thereby to move said latter flap outwardly relatively to the body of the package.
44. A device of the character described, including in combination, means adapted to carry a package having an open mouth, flaps adjacent thereto, and a liner within the body of said package and having its mouth extending above the upper edge thereof, means adapted to enter the mouth of the liner and spread the same, thereby to bring pressure to bear against the inner faces of certain of said flaps and spread said flaps, and means to engage the inner face of another of said flaps thereby to move said latter flap outwardly relatively to the body of the package, said latter means forming a part of said spreading means.
45. In a device of the character described, in combination, means adapted to receive articles having substantially upwardly extending flaps, and a liner therewithin, means for moving said flaps outwardly, means to close and seal said liner, and means for moving certain of said flaps successively into overlapping position to close the carton, and means for securing said flaps in carton closing position over the sealed liner.
46. In a device of the character described, in combination, means adapted to receive articles having substantially upwardly extending flaps, and a liner therewithin, means for moving said flaps outwardly, means to close and seal said liner, and means for moving certain of said flaps successively into overlapping position to close the carton, and means for causing the overlying contacting flaps to adhere to each other whereby to provide a permanent closure for the carton over the sealed liner.
47. In a device of the character described, in combination, means for receiving a carton having closure flaps adjacent an opening therein, means for closing a liner disposed within said carton comprising fingers effective to produce a bellows fold in the liner and presser elements effective to crease the fold and draw the edges of said liner together, and means for positively holding certain of said flaps in non-obstructing position during operation of said closing means.
48. In a device of the character described, in combination, means for receiving a carton having closure flaps adjacent an opening therein, means for closing a liner disposed within said carton comprising fingers effective to produce a bellows fold in the liner and presser elements effective to crease the fold and draw the edges of said liner together, and means for positively holding certain of said flaps in non-obstructing position during operation of said closing means, and means for closing said flaps upon said closed liner.
49. In a machine for packaging material in cartons, having liners, including in combination, means for tamping the material thereby to properly stow same in the liner, means for closing the liner, means for subsequently closing the cartons, and means for advancing the cartons from a random assemblage thereof to said tamping means.
50. A device of the character described, including means adapted to carry a package embracing a box, having flaps adjacent its upper edges and a material containing bag disposed within the body of the box and having an open mouth extending above the edges thereof, means for moving certain of the flaps of the box to extend at angles to the body thereof, means to retain said flaps in the angular position, means for sealing the mouth of the bag, means for moving the remainder of the flaps of the box out of the way of said bag sealing means, means for subsequently folding all of the flaps of the box to a position overlying the bag, and means assuring the retention of the flaps in such position.
51. A device of the character described, including means adapted to carry a package embracing a box having flaps adjacent its upper edges and a material containing bag disposed within the body of the box and having an open mouth extending above the edges thereof, means for moving certain of the flaps of said box extending at angles to the body thereof, and means for retaining the flaps in this position, means for folding and sealing the mouth of the bag and means for tucking same into the carton, means for subsequently folding the flaps of the box to overlie the tucked-in mouth of the bag, and means assuring the retention of the flaps in such position.
52. In a machine for packaging material in a carton having a liner, including in combination, means for folding the mouth of the liner, means for sealing it by application of pressure and heat, and means for pressing down the sealed mouth, and means for subse-

quently closing and sealing the carton about the sealed liner.

53. In a machine for packaging material in a carton having a liner, treated with a meltable substance, including in combination, means for forming bellows folds in the liner and bringing the edges adjacent the mouth together to close the same, means acting simultaneously therewith to apply heat to soften the meltable substance, thereby to effect a seal, and means for subsequently closing the carton flaps over the closed and sealed liner.

54. A device of the character described, including in combination, means to convey lined carton containing material, means to arrange and space said cartons from a random assemblage thereof and to align said cartons on the conveying means, means to stow the material within said cartons, means to insert advertising matter in said cartons, means to close and seal the material in the liner of the cartons, and means to close the carton.

55. A device of the character described, including in combination means to convey cartons each containing a bag of material, means to arrange and space said carton from a random assemblage thereof and align said cartons on the conveying means, means to stow the material within said cartons, means to transfer said cartons from the conveyor to the carrier plates for further movement, means to spread open the mouth of each bag and carton flaps adjacent said mouth, means to position said flaps out of the path of operation of subsequently acting bag closing mechanism, means to fold, means to close and means to seal the mouth of each bag, means to release said flaps from their restrained position, and means to close and seal said flaps over the mouth of the bag.

56. In a machine for packaging material in a carton having a liner, a portion of which is treated with a heat softenable material, including in combination means for pressing the treated portions of the liner together to close the same while applying heat to soften said material, thereby to effect a seal, and means for folding over the closed portion of the liner in the carton.

57. In a machine for packaging material in a carton having a liner, a portion of which is treated with a heat softenable material, including in combination means for pressing the treated portions of the liner together to close the same, while applying heat to soften said material thereby to effect a seal, and means for applying pressure to the closed portions in the presence of a cooling medium after the application of heat thereto.

58. In a machine for packaging material in a carton having a liner, portions of which are treated with a heat softenable material, including in combination means for pressing the treated portions of the walls of the liner together to close the same while applying heat

to soften said material thereby to effect a seal, means for folding over the closed liner portion in the carton, and means for applying pressure to the closed liner portion in the presence of a cooling medium after the application of heat thereto.

59. In a machine for packaging material in a carton having a liner, portions of which are treated with a heat softenable material, including in combination means for automatically advancing the carton successively to mechanisms for performing different operations thereon, means advancing with the advancing carton for pressing the treated portions of the liner walls together adjacent the mouth to close the liner while applying heat to effect softening of the material thereby to effect adhesion of the liner walls.

In testimony whereof we affix our signatures.

PETER W. FOSTER.
RICHARD S. POOLE.
MORRIS RAYMER.
JOHN L. KELLOGG.

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