April 19, 1938. R. M. BERGSTEIN 2,114,624

BAG OR LINER SEALING DEVICE

Filed March 18, 1937 5 Sheets-Sheet 1

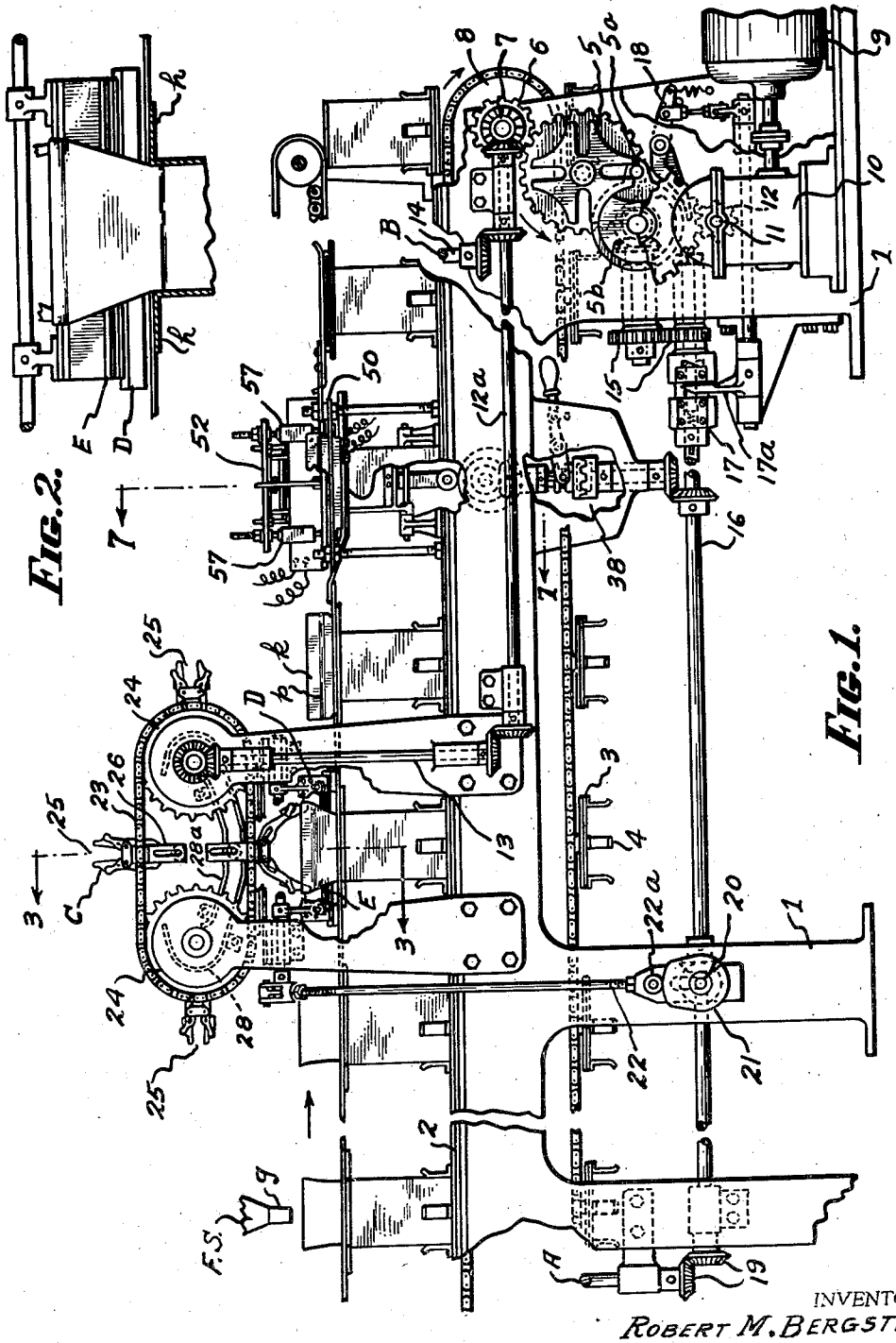

FIG. 2.

FIG. 1.

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April 19, 1938. R. M. BERGSTEIN 2,114,624

BAG OR LINER SEALING DEVICE

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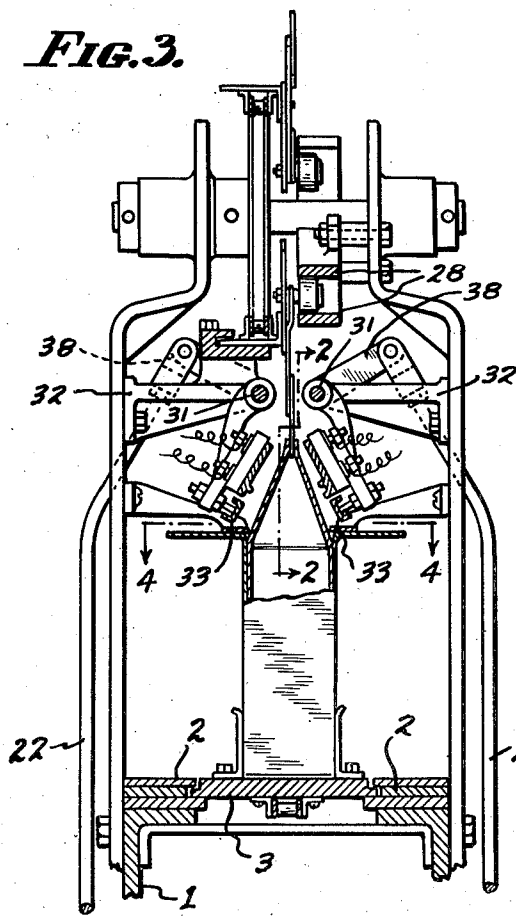
FIG. 3.



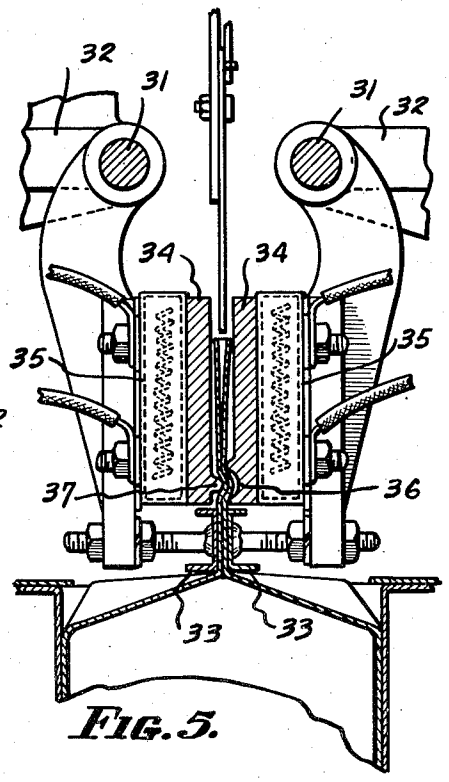
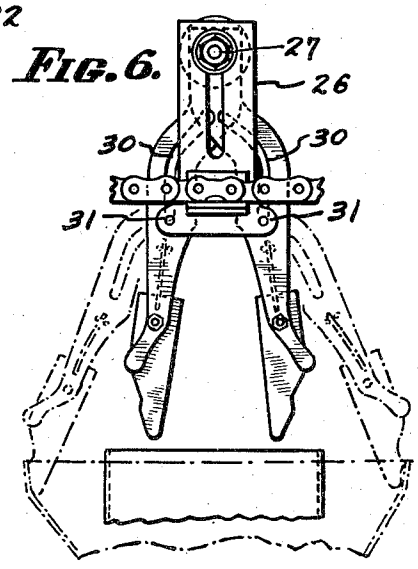


FIG. 5.

FIG. 6.



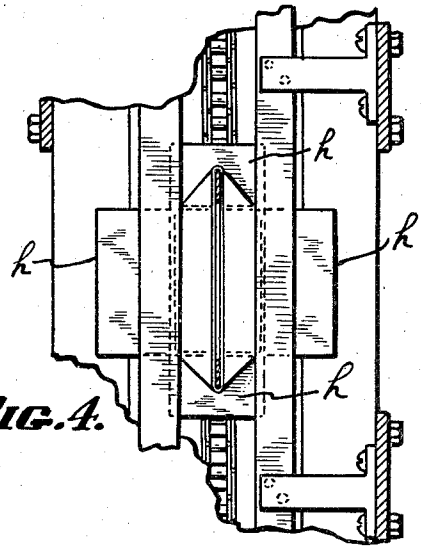


FIG. 4.

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BAG OR LINER SEALING DEVICE

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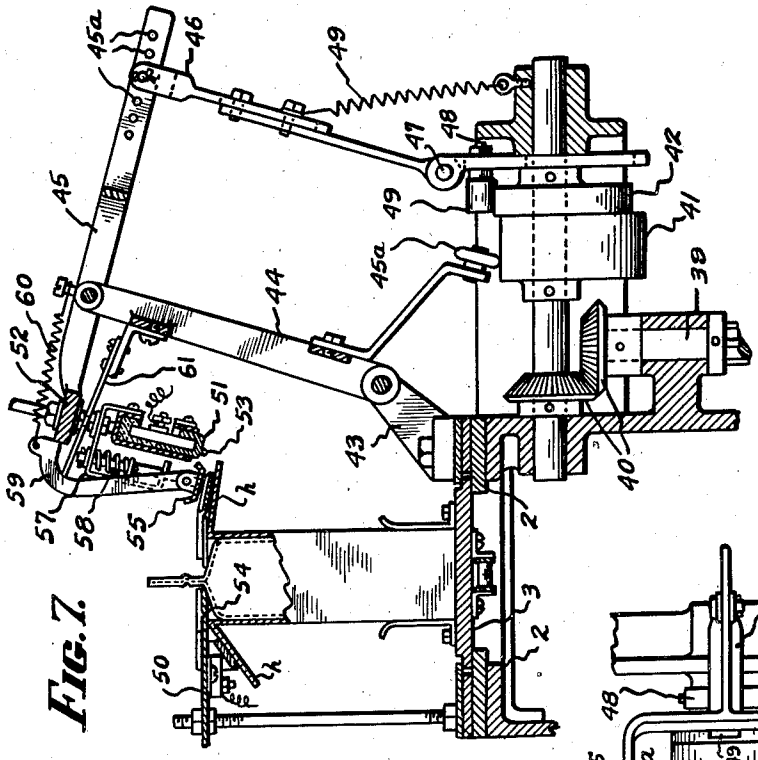

FIG. 7.

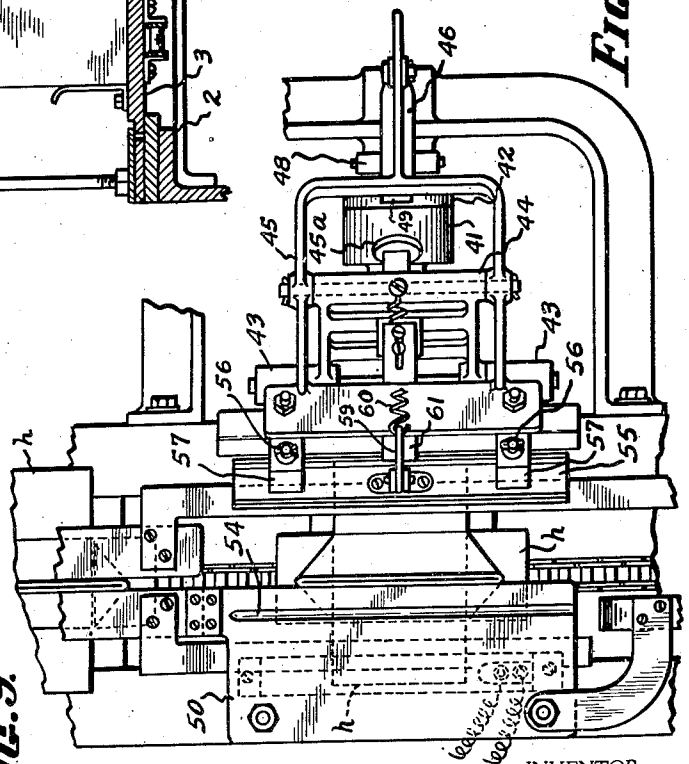

FIG. 8.

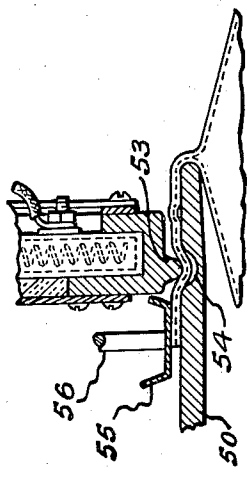

FIG. 9.

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BAG OR LINER SEALING DEVICE

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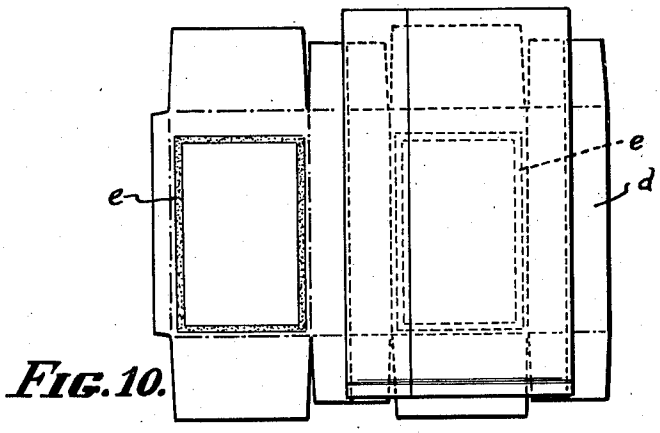


FIG. 10.

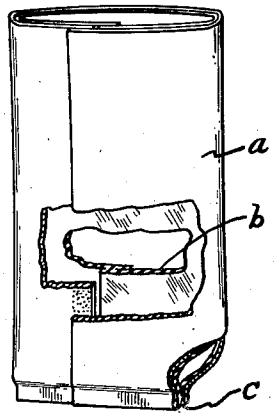


FIG. 11.

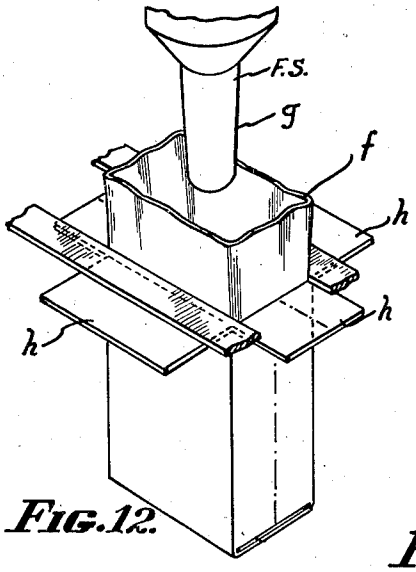


FIG. 12.

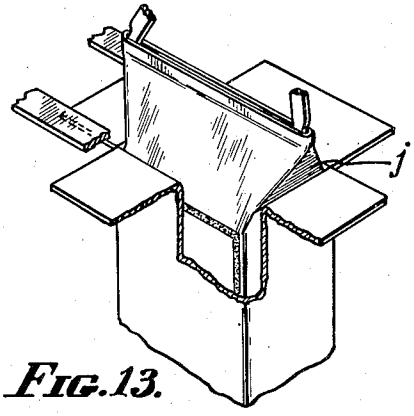


FIG. 13.

FIG. 15.

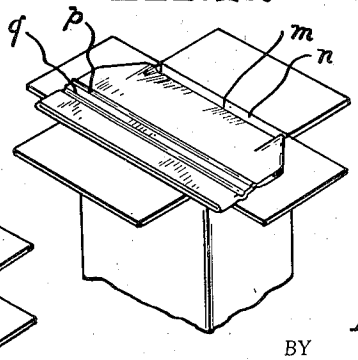


FIG. 16.

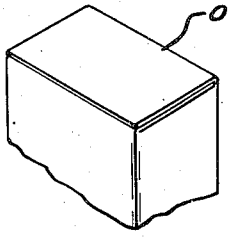
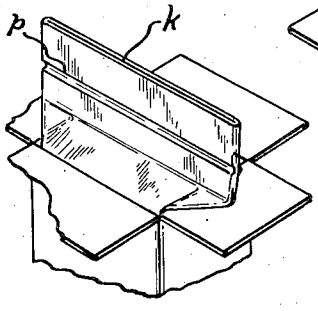


FIG. 14.



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April 19, 1938. R. M. BERGSTEIN 2,114,624

BAG OR LINER SEALING DEVICE

Filed March 18, 1937 5 Sheets-Sheet 5

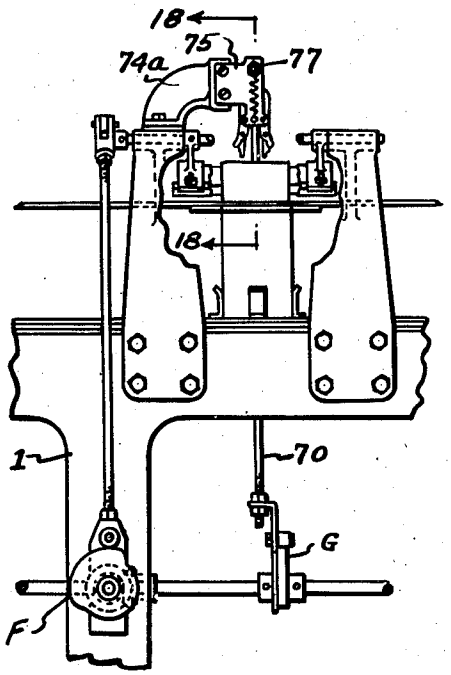

FIG. 17.

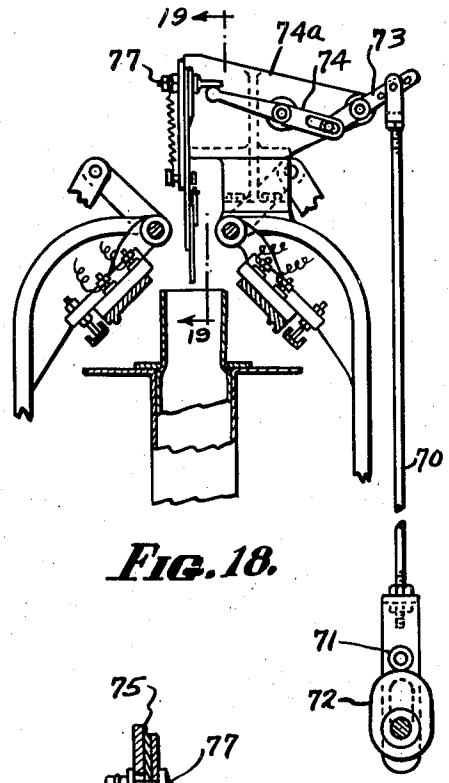

FIG. 18.

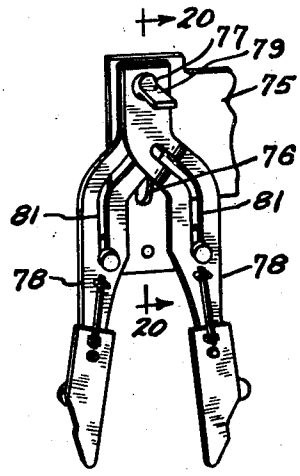

FIG. 19.

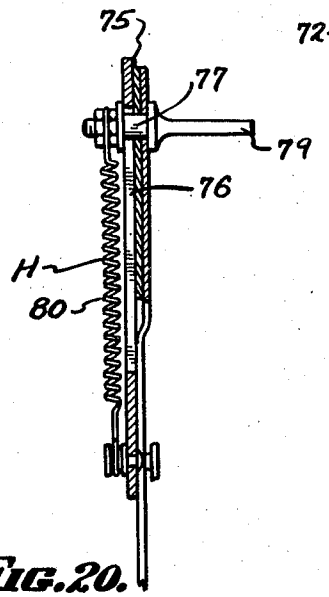

FIG. 20.

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Patented Apr. 19, 1938 2,114,624

UNITED STATES PATENT OFFICE

2,114,624

BAG OR LINER SEALING DEVICE

Robert M. Bergstein, Cincinnati, Ohio, assignor to Edna May Bergstein and himself, as trustees

Application March 18, 1937, Serial No. 131,738

25 Claims. (Cl. 93—6)

My invention relates to devices for closing and sealing the open end of bags having contents therein, said bags being made of substantially impervious flexible material, preferably heat sealable on the interior surface at least, all seams of which are hermetically sealed. This application constitutes an improvement or modification of the mechanism described in my application for Letters Patent Serial No. 95,124, filed August 10, 1936, showing a new and improved mechanism for carrying out the process and method described in my application for Letters Patent Serial No. 129,010, filed March 4, 1937.

According to my method the initial step consists of elongating the two opposite mouth walls of a bag, but as compared to my former mechanism, my present mechanism provides means for providing a seal by heat between the two flattened faces of the bag, while said flattened portion is still in upright position.

My invention also provides for heating elements which are movable in relation to each other, and I provide a pair of elements which are movable in relation to each other, which when in maximum operative position cause a curvature of a portion of the flattened area, and means for applying heat while so curved, to assure a dependable fusion of the interior surfaces along lines substantially defined by said curvature.

These movable elements may contact a portion of the flattened surface at any time after the flattening has been accomplished. As one example I have illustrated a means by which the elements may be incorporated to act synchronously with the sweeper plates which are used to produce the flattening of the upper mouth walls.

My invention also contemplates the incorporation of these movable heating elements to act synchronously with blades used to fold over the flattened mouth, after it has been flattened.

In certain cases, for the sake of assuring even more positive results so far as the hermetical closure of the top of the bag goes, it is desirable to apply two separate and distinct sets of heating means to the flattened upper bag wall area. In order to provide room for subsequent internal atmospheric expansion, according to my invention, the line of seal should be above the base of the flattened portion and also above the apexes of the triangles formed incidental to the flattening, so that the internal atmosphere sealed within the bag can expand by filling out the flattened portion up to the line of seal. As described in my present invention I have now disclosed means to bring together the two faces and apply heat to a portion of said area while held in contact throughout, either by two separate and distinct successive actions substantially to the same portion of the flattened area, or to bring this about in two different portions of the flattened area, with the lower sealed portion in any case being located above the apexes of the triangles formed incidental to the flattening, and the second sealed portion located above the same.

Still further objects of my invention will appear as the description proceeds.

I have provided certain new and improved mechanical devices for carrying out the operations noted, and the novelty of these will be set forth in the appended claims.

I have illustrated in the drawings a preferred mechanism and certain modifications thereof, and will describe the same, and will set forth the novelty therein in the claims that follow to which reference is hereby made.

In the drawings:

Fig. 1 is a side elevation with parts broken away, showing the intermittent drive mechanism. Also shows means A for operating a filling machine (left end) and means B for operating a device for gluing the carton top (right end). Spreader fingers C and wiper members D and sealing means E are also shown thereon and comprise the apparatus for the first sealing operation.

Also on Fig. 1 is the second sealing device with a clutch by which it may be thrown out of use.

Fig. 2 is a section along line 2—2 of Fig. 3 and shows the relation in length between the wiper bars and the bag top.

Fig. 3 is a section along line 3—3 of Fig. 1.

Fig. 4 is a section along line 4—4 of Fig. 3, showing how the hold down bars keep the carton flaps in out-turned position.

Fig. 5 is an enlarged section through the sealing device in closed position.

Fig. 6 is a front elevation of a spreader device, showing the open and closed positions.

Fig. 7 is a section along line 7—7 of Fig. 1, showing the second sealing device.

Fig. 8 is a plan view of the apparatus shown in Fig. 7.

Fig. 9 is an enlarged section showing the second sealing operation.

Fig. 10 shows the preferred type of carton blank with the bag laid thereon.

Fig. 11 is a perspective showing the construction of the preferred type of bag used.

Fig. 12 shows a filling operation.

Fig. 13 shows the spreading of the bag top.

Fig. 14 shows the first seal.

Fig. 15 shows the second seal.

Fig. 16 shows the closed carton.

Fig. 17 shows an alternative type of spreader device. The device is not mounted on a moving chain like the first embodiment, but is stationary and operated at the proper interval by a cam on the one revolution shaft.

Fig. 18 is a section along line 18—18 of Fig. 17, showing how the spreader is operated by a system of links.

Fig. 19 is a perspective looking in the direction of line 19 on Fig. 18.

Fig. 20 is a section along line 20 of Fig. 19.

The machine frame I have indicated generally at 1. Upon an inwardly projecting pair of supporting and guiding bars 2, 2 (Fig. 3) is conveyor 3 caused to travel in a step by step movement. This conveyor has cages 4 thereon into which a carton is placed and carried to a filling station F. S. where the product to be packed is placed therein, thence to the other mechanisms to be described, and finally to a flap closing and gluing device (not shown). The step by step movement is derived from a Geneva movement indicated at 5, which drives a pinion 6 on a cross shaft 7 carrying the sprocket 8 that drives the conveyor. A motor 9 supplying the drive for a gear reduction box 10, drives a cross shaft 11, on which shaft is a gear 12 that drives the Geneva movement.

A shaft 12*a* driven from the shaft 7 by mitre gears, serves to drive the chains for the mouth spreading devices, through a vertical shaft 13. The same shaft 12*a* drives another vertical shaft 14 which operates the carton flaps closing devices (not shown).

On the other side of the machine from the motor the shaft 11 is geared by means of gears 15 to a shaft 16 extending lengthwise of the machine, there being a one revolution clutch device 17 of any standard type interposed between this shaft 16 and said gearing 15. The one revolution clutch is operated by a shipper indicated generally at 17*a* in turn controlled by a bell crank lever 18 actuated by the pin 5*a* on the continuous motion member 5*b* of the Geneva movement.

The shaft 16 by mitre gears 19 drives the filling device (not shown). It also drives the air evacuating sweepers or wipers. To this end a cross shaft or cam shaft 20 is driven by mitre gears from the said shaft 16. There are cams 21 on this shaft at both sides of the frame, and cam riders 22*a* on the ends of vertically extending rods 22, are actuated by these cams. The rods operate the sweepers.

The exact arrangement of the drives for the several devices is not insisted upon except that all devices be timed with relation to each other, which it will be noted from the above description is accomplished herein by driving all of the devices from a common source.

The mouth spreading device is the same as in my former application. In consists of a chain or chains 23 passing around sprockets 24 mounted on uprights of the frame of the machine. The spreading fingers in pairs as shown at 25, are pivotally and slidably held in supports 26 that are carried around by the chains. The pivotal element for the jaws of each pair is a stud 27 which lies in a slot in their support 26 and has a roller thereon, which roller engages in a track 28, that functions as a cam track. The jaws themselves have slots 30 therein functioning as cam slots which engage over studs 31 on the supports. The cam track may be omitted at the upper portion of the travel of the device, as indicated.

This mechanism is so arranged that as the chain is driven around the jaws are timed so that a pair of them will enter the open top of each filled package as it moves away from the filling station. The jaws travel with the package as yet unspread, but when the rollers engaging the cam track come to the portion 28*a* of the track they are energized toward the chains, and hence push the pivotal center of the jaws toward the travelling package. This results in a spreading of the jaws because of the cam slots in the said jaws.

The jaws remain in position in the carton, in the present machine when it comes to a stop in the step by step movement of the package, but as the package moves away on the next operation, the jaws swing up and together, leaving the package without disturbing its then condition.

Since the remainder of the mechanism operates in a different way from my former device, I will at this point refer to the structure of the carton and liner device for use with which my machine is particularly designed, and to the several operations to be accomplished.

In Fig. 11 is illustrated a liner or bag element of the carton. This has an outer cover *a* of suitably strong paper and an inner sheet of heat fusible material *b*. In laminating these layers they are offset so that the side seam of the bag is formed by fusing the inner layer directly to itself, with the outer layer glued together on a different line. The bottom of the bag is closed by heat sealing it directly across as indicated at *c*. The inner sheet lies within the projecting or unclosed end of this bag.

In associating this bag with a carton it can be deposited on a blank indicated at *d*, which has glue lines upon its two main panels, as indicated at *e*. The significant feature in the location of the glue lines is that the ones at that portion of the carton which will be uppermost are removed from the edge of the walls. When the blank is closed in the usual way as in a folder and gluer the bag will be caused to adhere to the carton. Thus when the carton is opened and placed into a cage on the conveyor above described, the lining will open out with it, leaving the projecting portion indicated at *f* (Fig. 12). When in this condition the product to be packed is fed into the open bag, as from a spout *g*. The operation requires the closing flaps generally indicated at *h*, of the carton to be held out of the way, as indicated by the hold down bars. Filled with material the package thus comes to the station (Fig. 13) where the spreader fingers distend the mouth of the bag. This operation pulls on the bag from the upper glue lines where it adhesively joins the interior of the carton, forming a triangular arrangement *j* in cross section with the ends indented. It is then that the air evacuating sweeps come in and deflate the structure as indicated at *k*, so that the air is swept out of it. Incidentally there is still some triangular relation because the sweeps will snugly pull the bag to the position indicated in Fig. 14. Then when the folding operation indicated at *m* takes place, there will be spaces *n*, at each side between the top of the liner bag and the top of the box. This space remains

when the box is closed by means of its flaps, and is ready for shipment as indicated at *o* in Fig. 16.

In Fig. 14 is indicated the heat sealed joint *p* and in Fig. 15 the additional heat sealed joint *q*. I will now describe the mechanism whereby the evacuating operation and folding over operation is accomplished coincidentally with forming the seals.

Mounted on rock shafts **31** one at each side of the path of travel of the spreader finger chain, are the sweeps or wipers which have supports **32**, and inverted channels **33** mounted adjustably on their lower ends. Also on the supports are the heat sealing devices, consisting of plates **34**, heated by some suitable electric heating element **35**. One of the plates **34** has a groove **36** therein, and the other has a rib **37** thereon. The setting of the inverted channels is such that when they come together (Fig. 5) the rib on the one heating plate will not bottom in the groove in the other heating plate but will force the bag material to deflect somewhat into the groove. As explained in my previous application this deflection of the layers to be heat sealed together results in a complete fusing together without points of separation, and also without positive compression from both sides which is always likely to destroy the heat fusible material by attenuating the thickness of the film and leaving an improperly sealed area.

The rock shafts are operated by arms **38** engaged by the two cam operated rods, already noted.

It has already been pointed out that the swinging in of the two devices will be to engage the bag close to the upper edge of the carton, from which the mouth distending jaws have already somewhat pulled the bag material, and swinging inwardly to deflate the distended mouth forcing the air up and out of it, and bringing the bag walls together. The heater plates just above the inverted channels which perform this operation will then engage the bag, cause the depression across it due to the rib and groove above noted and the heat will fuse the walls of the bag together.

It is significant that the arrangement shown does not form the seal directly at the angle of divergence of the bag walls where they are swept together, but well above this line. There is thus no immediate tendency to strip the seal apart which would otherwise be present when the bag relaxes from the effect of the sweeps or wiper.

The mechanism for folding over the pinched together mouth of the bag is operated as has been stated from the lengthwise shaft **16**, and is thus under the control of the one revolution clutch, the timing of which also controls the timing of the air evacuators and sealer. From this shaft **16** by mitre gears, and a clutch **38**, which can be used to disconnect this folding mechanism if desired, a vertical shaft **39** is driven, which shaft by mitre gears **40** drives a cam shaft supported in the frame of the machine and having two cams **41** and **42** thereon. A fixed arm **43** on the frame serves to provide the main pivot for the folder device. On this arm is pivoted a bar **44**, which carries a cam roller **45***a* that rests on the cam **41**. The folder device is mounted on a yoke **45**, which is pivoted to the upper end of the bar **44** by means of a suitable cross member. The outer end of this yoke, which is a single bar, is connected to a link **46** of adjustable length, carried on a pivot **47** on the guided yoke **48** engaging loosely over the cam shaft, and having a cam roller **49** thereon engaging the other cam **42**. A spring **49** pulls downwardly on this link, and the action of the link is generally to provide a semi-parallel motion device for the folder mounting yoke **45**. The link is adjustably pivoted to the yoke by a pin which can engage a selected hole **45***a* in the projecting bar portion of the yoke.

The cams so operate that first the cam **41**, operating in time as controlled by the one revolution shaft **16**, rocks the device on its pivot on the arm **43**, and causes the folder mounting yoke **45** to swing across the top of a package, which has been delivered to the proper point by the main conveyor in a very flat arc. The other cam then comes into operation to tilt the yoke **45** somewhat, prior to the frame moving back again under the influence of the first cam and the action of the spring **49**.

Referring now to the folding device itself, and referring first to the sealing elements, these consist primarily of an accurately located plate **50** which as the package advances with the closing flaps held down, rides over the top of the package, closely alongside of the upstanding preliminarily sealed or collapsed bag mouth. It also consists of an electrically heated plate **51** held adjustably on a cross bar **52** on the main mounting yoke. This plate has a rib **53** on its end which comes down over the bag mouth which has been deflected, and the rib comes opposite a groove or slit **54** in the fold supporting plate **50**. The result is to form a heat seal in the inwardly curved portion of the bag as in the first instance, and with the same advantages.

The folding bar itself is a beveled edge plate **55**, held on the end of a pair of rods **56**. The rods are mounted in brackets **57** held to the same cross bar of the yoke as the heating element plate, and springs **58** around the rods tend to force the plate downwardly. When the yoke is swung across the top of the package, the folding bar engages the projecting portion of the bag and folds it over against the plate **50**. When this occurs the heating element is brought down somewhat by the tilting of the yoke on its pivot to the bar **44**, causing the indentation of the folded over bag portion, this movement being caused by the operation of the cam member **42**, as already noted.

The effect of tilting the yoke somewhat to bring about the heat sealing, is to operate a latch that acts on the folding bar. This latch shown at **59**, is pivoted to the top of the folding bar, and is held by a spring **60** against the edge of the cross bar on which the heat sealing element is mounted (Fig. 7). The depression of the yoke to bring about the heat sealing compresses the spring that holds the folding bar and the latch rides up over the top of this cross bar. The reason for this is to avoid the effect of the springs **58** when the folding device is withdrawn by the reverse movement of the yoke, as it would tend to drag on the bag material and perhaps ruin the effect of the heat seal, which is at that time very plastic. Being held up by the cross bar the springs cannot function. As the yoke swings away however, an arm **61** pushes outwardly on the latch and disconnects it from the top of the cross bar.

The operation now described places a second heat seal in the bag mouth, preferably on a line above the first. If the first seal is not made, and plain wipers used without heat sealing plates, then this seal made while folding over the bag will adequately serve for most purposes. The double seal is simply an assurance against any

possible leakage. In Fig. 9 is illustrated on a large scale the relationship of the several parts while the second heat seal is being made in the folded over bag end.

It now remains to describe a modification of the mouth distending jaw device, which is shown in Figs. 17 to 20. In this construction in which the heat sealing and evacuating elements are the same as in the first instance, the distending jaws are shown as operated by a rod 70, having a cam follower 71 over a cam 72. By means of a lever 73 the rod serves to rock a pivoted rocker arm 74 which controls the jaw operation.

On the frame part 74a which mounts the lever and rocker arm, is a support, somewhat like one of the supports on the chain device first described. This support 75 has a slot therein as at 76 in which slides the pivot pin 77 of the two spreader jaws 78. This pin has a projecting finger 79 which is engaged by the rocker arm 74 so as to elevate the jaws by raising up on the pivot pin, the depression of the jaws being caused by a spring 80 which engages the other end of the pivot pin. The jaws have slots 81 therein as before, riding on pins on the support. The result is that when the rocker arm relaxes from holding up the finger on the pivot pin, the jaws are moved down by the spring, at first together and then spreading as they move down, thus distending the mouth of the bag. When the operation is reversed the jaws swing in and then up out of the bag mouth.

This device can be readily timed to operate in sequence with the evacuating and heat sealing devices, first spreading the bag mouth, and holding it during evacuation and sealing, and then rising so as to permit the package to move to the next station for closing the carton flaps.

Also the sealing devices could be mounted on a carriage to move along with the package, thus avoiding a stoppage of the package for closing and sealing. Finally, instead of applying the sealing and closure to a liner in a carton, it could as well be applied to a bag suitably supported and fed along to the several mechanisms.

By reference to bag in the claims that follow I wish to include a carton liner or an independent bag.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for flattening the mouth of the bag, and means for applying heat to a limited zone across the flattened mouth substantially above the apex of the taper on the bag resulting from the flattening operation while the walls of the bag are held together by the flattening means.

2. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for flattening the mouth of the bag, and means for applying heat to a limited zone across the flattened mouth substantially above the apices of the triangles formed at the two ends of the bag resulting from the flattening operation while the walls of the bag are held together by the flattening means.

3. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to expel the air from the mouth of the bag, and means for applying heat to a limited zone spaced substantially above the apex of the taper on the bag resulting from the wiping operation while the juxtaposed bag walls are extended.

4. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to expel the air from the mouth of the bag, and means for applying heat to a limited zone substantially above the apex of the taper on the bag resulting from the wiping operation, said wiping and sealing mechanism being applied while the bag is at rest at one station, and means for feeding bag step by step to the said mechanism.

5. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to remove the air from the mouth of the bag, and means for applying heat to a limited zone above the apex of the taper on the bag resulting from the wiping operation, said wiping and sealing means comprising frames having wiping elements at their lower ends arranged to move in from the sides of the bag at the top thereof, and heat sealing elements located above the wiping elements.

6. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to remove the air from the mouth of the bag, and means for applying heat to a limited zone above the apex of the taper on the bag resulting from the wiping operation, said wiping and sealing means comprising swinging frames having wiping elements at their lower ends arranged to swing inwardly over the top of the bag, and heat sealing elements located above the wiping elements.

7. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to remove the air from the mouth of the bag, and means for applying heat to a limited zone substantially above the apex of the taper on the bag resulting from the wiping operation, and means to contact the heat applying means with a portion of the wiped together bag at both sides thereof, while held by, but successively to, the wiping means.

8. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for flattening the mouth of the bag, and means for applying heat to a limited zone substantially above the apex of the taper on the bag resulting from the flattening, said zone being defined by a projection and depression on the heat applying means which deflects the bag into a curve, said projection and depression so arranged as not to bottom the bag material at the depression.

9. A mechanism for closing and sealing a filled bag comprising means for distending the mouth of the bag, means for wiping the bag to expel the air from the mouth of the bag, and means for applying heat to a limited zone above the apex of the taper on the bag resulting from the wiping operation, and means to contact the heat applying means with the wiped together bag at both sides thereof, at the same station with, but successively to the wiping means, said heat applying means formed of elements having a depression and projection respectively to deflect the respective bag portions into a curve said projection and depression so arranged as not to bottom the bag material at the depression.

10. A fold over and heat sealing mechanism for liners in cartons which comprises a folding member moving across the top of the carton, and a

forming plate extending partially across the top of the carton, and a heat sealing element moving with the said folding member and arranged to contact with a limited portion only of the liner that is folded over by the moving member.

11. A fold over and heat sealing mechanism for liners in cartons which comprises a folding member moving across the top of the carton, and a forming plate extending partially across the top of the carton, and a heat sealing element moving with the said folding member and arranged to contact with a portion only of the liner portion that is folded over by the moving member, said members arranged to operate on a carton while at rest at one station, and means for feeding cartons step by step to the said mechanism.

12. A fold over and heat sealing mechanism for liners in cartons which comprises a folding member moving across the top of the carton, and a forming plate extending partially across the top of the carton, and a heat sealing element moving with the said folding member and arranged to contact with the liner portion that is folded over by the moving member, said folding member having a flat arc of movement across the top of the carton and the heat sealing element being mounted together with the folding member but arranged not to contact with the folded over liner except upon an additional movement applied thereto.

13. A fold over and heat sealing mechanism for liners in cartons which comprises a folding member moving across the top of the carton, and a forming plate extending partially across the top of the carton, and a heat sealing element moving with the said folding member and arranged to contact with a limited portion only of the liner portion that is folded over by the moving member, and means to apply the folding member without applying the heating member and successively applying the heat sealing element.

14. A fold over and heat sealing mechanism for liners in cartons which comprises a folding member moving across the top of the carton, and a forming plate extending partially across the top of the carton, and a heat sealing element moving with the said folding member and arranged to contact with the liner portion that is folded over by the moving member, said heat sealing element, and the forming plate having respectively a depression and a projection whereby the liner material is deflected in a curve along the line where heat is applied, said projection and depression so arranged as not to bottom the bag material at the depression.

15. A fold over and heat sealing mechanism for the purpose described, comprising a pair of elements movable across the top of a bag, one of said elements being a folding plate, and the other a heat sealing element, the folding plate being in advance of the heat sealing element and the heat sealing element of a dimension to engage only part of the folded over portion of the bag.

16. A fold over and heat sealing mechanism for the purpose described comprising a fold over device movable across the top of a bag to fold down the liner, and a heat sealing element moving with the fold over device and arranged to contact a limited portion only of the folded over liner portions.

17. A fold over and heat sealing mechanism for the purpose described comprising a fold over device movable across the top of a bag to fold down the liner, and a heat sealing element moving with the fold over device and arranged to contact the folded over liner portions, a support over which the liner is folded, and said support and the heat sealing element having respectively a projection and a depression defining a zone lengthwise of the liner, and heat sealing elements being applied to depress the liner into said zone said projection and depression so arranged as not to bottom the bag material at the depression.

18. In a bag closure and heat sealing means, members to flatten the mouth of the bag and members at the same time to apply heat entirely across a portion only of the mouth which portion is substantially spaced from the point of juxtaposition of the bag walls brought together by the flattening members, and means for operating said members.

19. In a bag closure and heat sealing means, members to wipe inwardly over the top of the bag and members at the same time to apply heat across the bag portions brought together by the wiping members, and means for operating said members, means for moving the bag to another station, and means at that station to fold over the sealed together bag and at the same time apply heat to additionally seal the bag portion together along a zone located above the first seal.

20. In a bag closure and heat sealing means, members to wipe inwardly over the top of the bag and members at the same time to apply heat across a portion of the bag brought together by the wiping members, and means for operating said members, means for moving the bag to another station, and means at that station to fold over the sealed together bag and at the same time apply heat to additionally seal the bag portion together along a zone located above the first seal both of said seals being formed in across a curvedly depressed zone of the bag portions but without pressure applied to the layers of the liner.

21. In combination a bag mouth distending device arranged to bring into substantially a line, the upper end of said mouth, means for applying the same to a bag while it is moving to a station, a pair of swinging frames located at said station, means to swing them over the top of the bag when same is at said station, said frames having at their lower ends wiping bars and above the wiping bars heat sealing elements.

22. In combination a bag mouth distending device arranged to bring into substantially a line, the upper end of said mouth, means for applying the same to a bag while it is moving to a station, a pair of swinging frames located at said station, means to swing them over the top of the bag when same is at said station, said frames having at their lower ends wiping bars and above the wiping bars heat sealing elements, the parts being so arranged that the heat sealing elements are applied after the wiping elements have been applied.

23. A fold over and heat sealing mechanism for bags which comprises a folding device arranged to turn at substantially right angles, from the central zone, the projecting mouth of the bags, a heat sealing element moving with the folding device and arranged to contact the folded over bag portions when they have been so folded over, said element adapted to seal the same across a restricted zone defined by a curve in the assembled liner layers of said folded over portion.

24. A fold over and heat sealing mechanism

for liners of cartons which comprises a folding device arranged to turn at substantially right angles, from the central zone, the said projecting liner, a heat sealing element moving with the folding device and arranged to contact the folded over liner portions when they have been so folded over to seal the same, said mechanism including a member constrained to move in a flat arc, means for resiliently supporting the folding device thereon, means for supporting the heat sealing element thereon, a support for said flat arc moving member upon which it can be rocked as well as swung, and means for rocking said member after it has swung to complete the folding, thereby to apply the heat sealing element.

25. A fold over and heat sealing mechanism for liners of cartons which comprises a folding device arranged to turn at substantially right angles, from the central zone, the said projecting liner, a heat sealing element moving with the folding device and arranged to contact the folded over liner portions when they have been so folded over to seal the same, said mechanism including a member constrained to move in a flat arc, means for resiliently supporting the folding device thereon, means for supporting the heat sealing element thereon, a support for said flat arc moving member upon which it can be rocked as well as swung, and means for rocking said member after it has swung to complete the folding, thereby to apply the heat sealing element, and means for latching the folding device against resilient movement upon the said rocking movement being applied.

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