April 5, 1949. J. G. VERGOBBI 2,466,341

CONTAINER FORMING MACHINE

Filed March 27, 1947 4 Sheets-Sheet 1

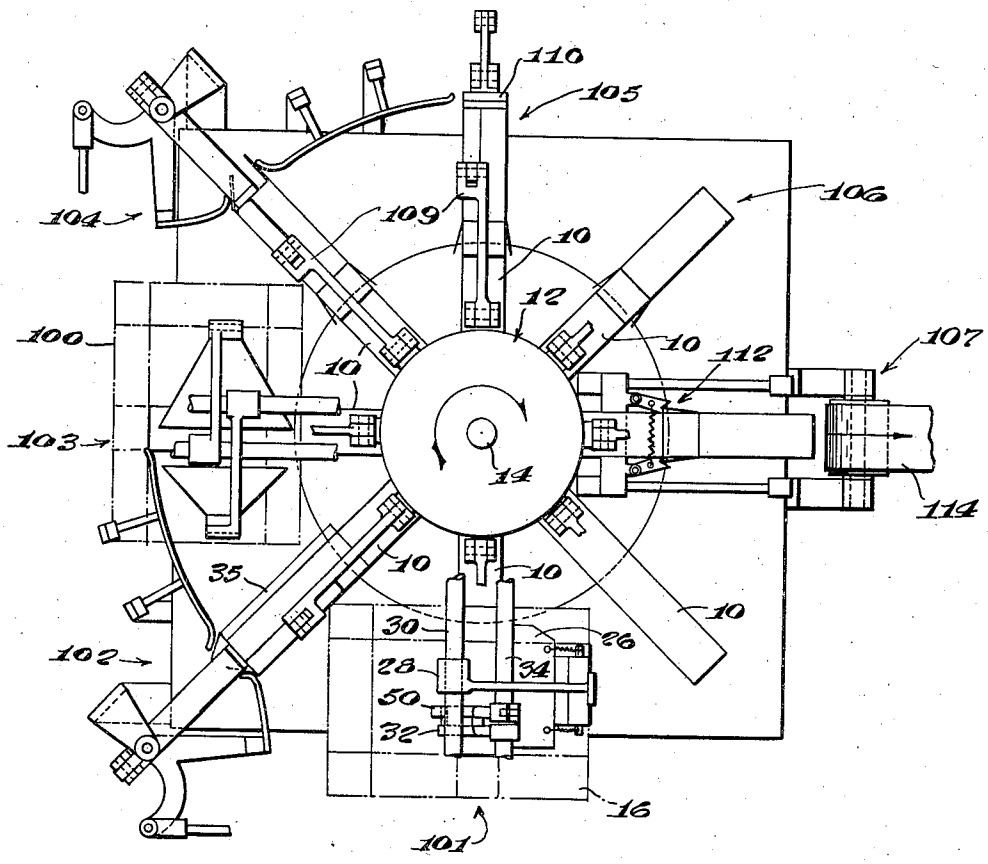



Fig. 1

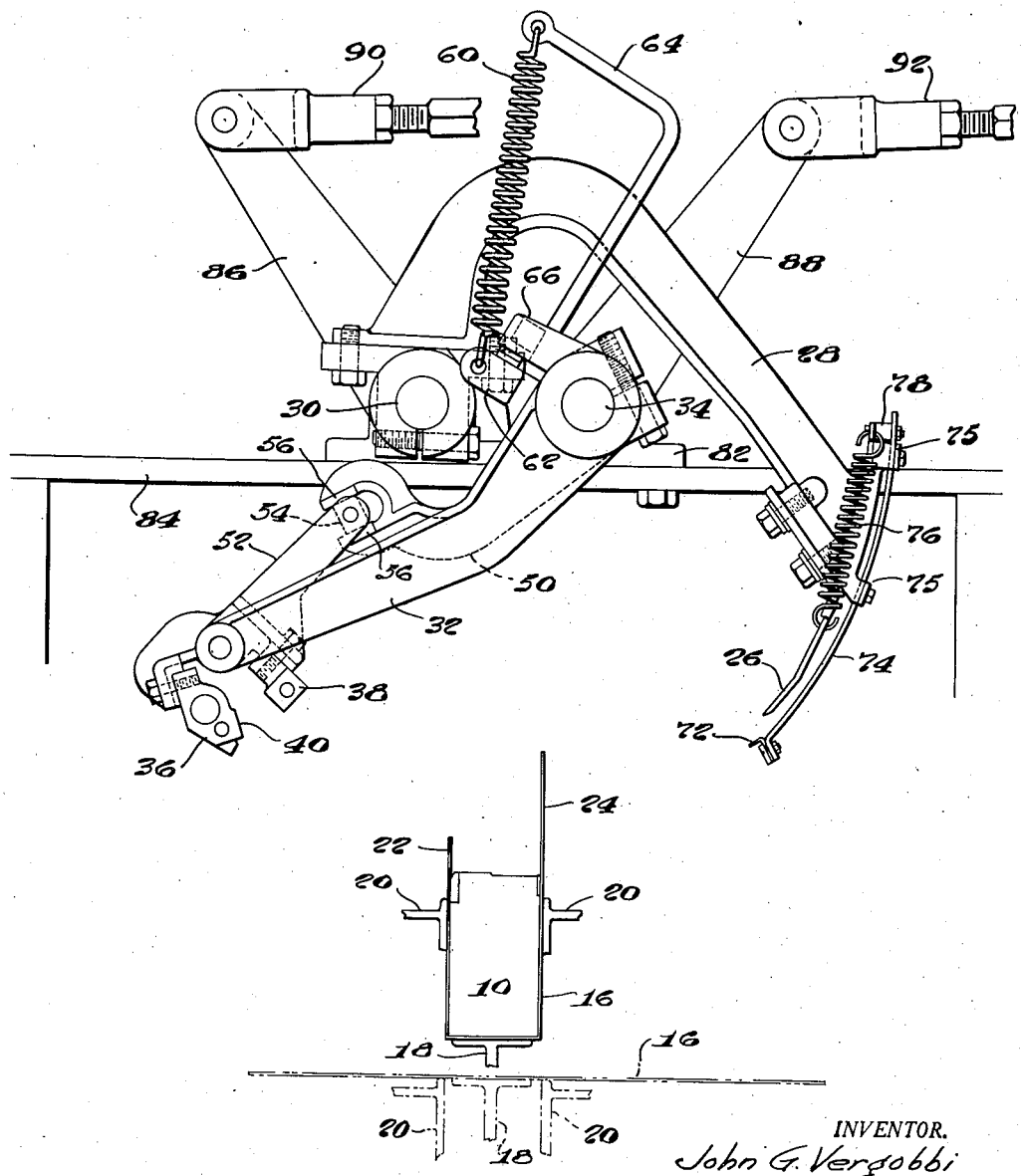
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Fig. 2




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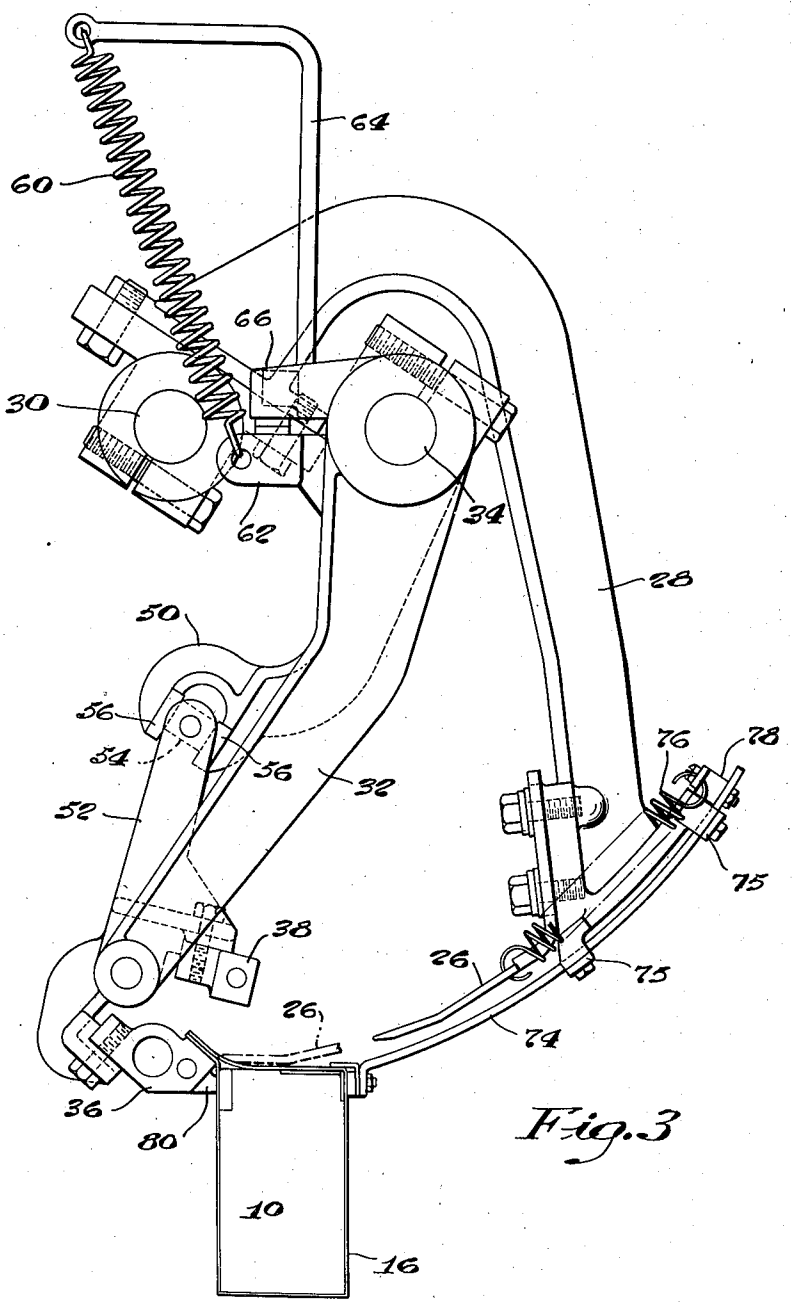



Fig. 3

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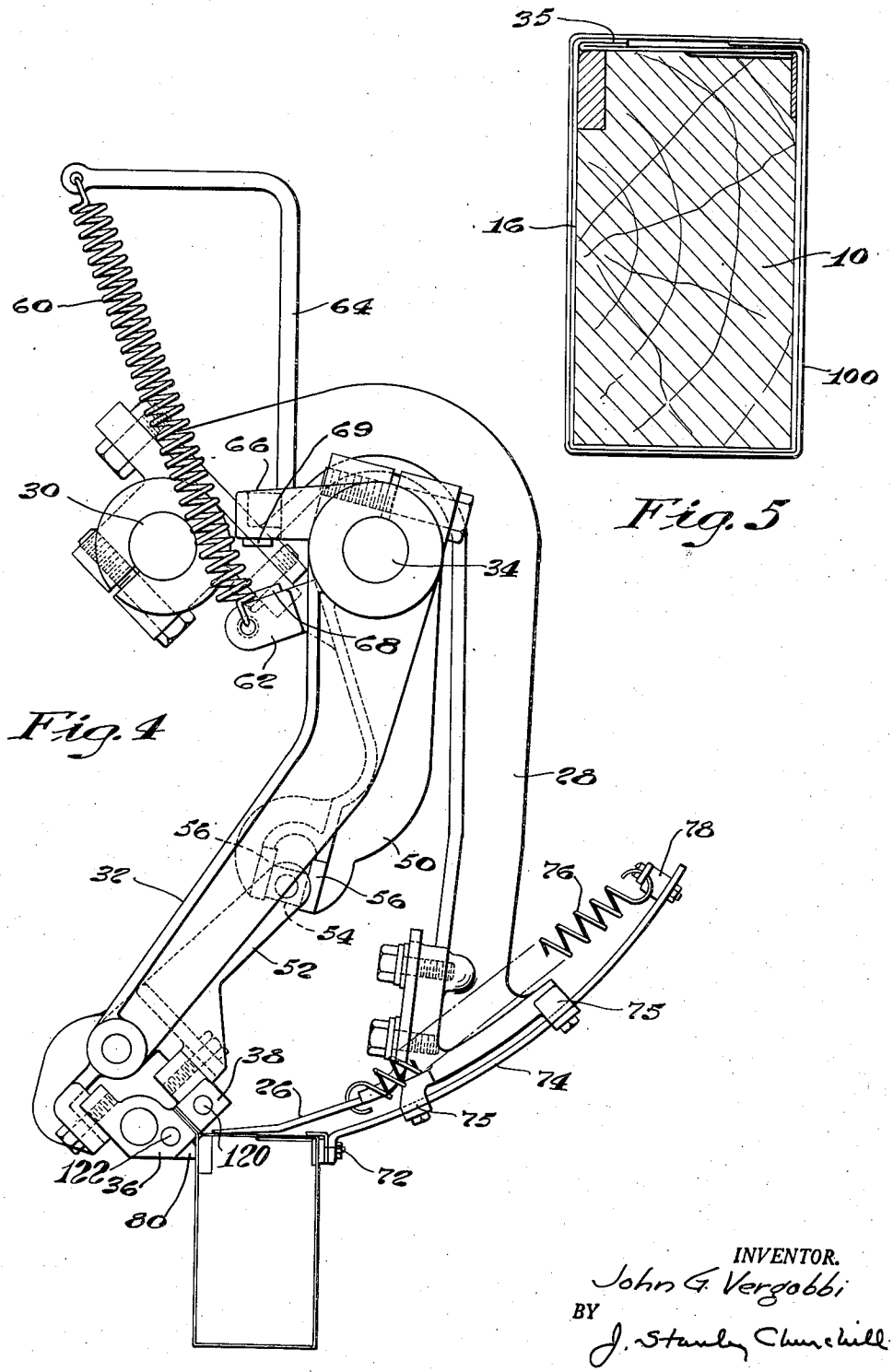



Fig. 5

Fig. 4

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Patented Apr. 5, 1949

2,466,341

# UNITED STATES PATENT OFFICE

2,466,341

## CONTAINER FORMING MACHINE

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Application March 27, 1947, Serial No. 737,588

4 Claims. (Cl. 93—44.1)

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This invention relates to a container forming machine.

The invention has for an object to provide a novel and improved container forming machine of the type provided with a forming block or mandrel about which a blank of container forming material may be wrapped to form the container and in which novel mechanism is provided for forming a fin type or face to face seam in the blank while disposed on the forming block, and in a novel, efficient and superior manner.

With this general object in view and such others as may hereinafter appear the invention consists in the container forming machine and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention, Fig. 1 is a plan view of a container forming machine of the type in which the present invention may be embodied; Fig. 2 is a front elevation of the seam forming mechanism embodying the present invention, the parts being shown in their retracted position; Figs. 3 and 4 are similar views illustrating the parts in different positions of operation for producing a fin type seam; and Fig. 5 is a cross sectional view of the forming block showing a carton blank wrapped about the previously formed lining blank.

In general the present invention contemplates a novel mechanism in a container forming machine for forming a rectangular container having a face to face or fin type seam. The invention is herein illustrated as embodied in a container forming machine of the type adapted to form a container comprising a liner bag and a carton, about a forming block or mandrel and which may comprise a machine of the general type illustrated and described in the United States patent to Hesser No. 1,020,821, issued March 19, 1912. Such prior container forming machines are provided with a plurality of forming blocks arranged to be intermittently moved to present the forming blocks successively to the various lining bag and carton forming stations of the machine. In the operation of such machines a lining blank is first folded about a forming block to form a tube and at a succeeding station of operation portions of the lining blank extending beyond the end of the forming block are folded and sealed to form the bottom of the lining bag. At subsequent stations an

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outer blank or carton is wrapped about the liner bag on the block in a similar manner whereupon the composite liner and carton may be stripped from the forming block ready to be filled and top sealed. Such prior container forming machines are designed to form a rectangular liner having overlapping side seams, and, it is the aim of the present invention to provide novel mechanism for forming a face to face or fin type seam for the liner while disposed on the forming block.

Referring now to the drawings 10 represents the forming blocks secured to a spider 12 mounted upon a central shaft 14 arranged to be intermittently rotated to present the forming blocks to successive stations in the formation of a composite liner and carton. Inasmuch as machines of this type which are provided with mechanisms for wrapping first the liner about the forming block and for subsequently wrapping the outer wrapper or carton thereabout, are well known in the packaging art only sufficient portions of the machine have been herein illustrated and will be hereinafter described as will enable the present invention to be understood.

In the operation of the machine, a blank of container forming material, which may comprise a sheet of heat sealable paper 16, is fed into operative position beneath a forming block 10 and on top of vertically reciprocal plates 18, 20 arranged to be elevated to wrap the blank about the bottom and two sides of the block 10, as illustrated in Fig. 2. In practice the bottom plate 18 is elevated to present and retain the blank in firm engagement with the undersurface of the block while the side plates 20 continue upwardly to wrap the blank against the sides of the block, leaving opposed portions 22, 24 of the blank extended vertically beyond the top surface of the blank, as illustrated.

The bottom and side folding plates 18, 20 may be cam operated in timed relation to and through connections from the container forming machine, and may comprise mechanisms similar to those now in use as illustrated in the patent to Hesser above referred to.

The blank thus folded about the block is now in position to be operated upon to fold the extended portion 24 across the upper surface of the block and to bring the longitudinal marginal edge of the portion 24 into face to face relation with the longitudinal marginal edge of the portion 22 adjacent one edge of the block preparatory to sealing said longitudinal marginal edges by the application of heat and pres-

sure. As herein shown, this operation is accomplished by mechanism including a curved folding plate 26 carried by a rocker arm 28 mounted fast on a horizontal shaft 30. A second rocker arm 32 loosely mounted on a horizontal shaft 34 carries a pair of electrically heated seam pressing jaws 36, 38 the lower jaw 36 of which is fixedly attached to the arm 32 and provided with a presser face 40. The electrical heating means for the jaws 36 and 38 may be placed in the said jaws as indicated at 120 and 122 (Fig. 4). In operation, the arm 32 is rocked to present the jaw 36 adjacent the upper left edge of the block and with the presser face 40 disposed at an angle of approximately 45° extending outwardly from the edge of the block, as illustrated in Fig. 3.

In the operation of the machine, the curved folding plate 26 is rocked to engage the extended portion 24 of the blank and to fold it across the upper face of the block, thus presenting the marginal edge of the extension 24 face to face with the extended marginal edge 22 and against the angularly disposed face 40 of the lower presser jaw 36. Thereafter, in operation, the curved folding plate 26 is retracted slightly and the upper jaw 38 is moved into cooperating engagement with the lower jaw 36 to press and heat seal the marginal edges together to form a seam.

As herein illustrated, the upper jaw 38 is carried by and pivotally mounted in the arm 32 and is arranged to be rocked into and out of sealing position by an arm 50 fast on the rocker shaft 34. The jaw 38 is provided with an extension 52 which carries a swivel block 54 arranged to be slidingly received between guides 56 formed in the open end of the arm 50. The arm 50 fast on the shaft 34. and the arm 32 loosely mounted thereon, are normally held together, as shown in Fig. 2, to be moved in unison by a spring 60 connected between an extension 62 formed on the arm 50 and a spring hook 64 attached to an extension 66 from the arm 32. Each extension 62, 66 is provided with a stop stud or hardened pin 68, 69 arranged to meet to limit the relative rocking movement of the parts in one direction and to dispose the parts in their open jaw position, as shown in Fig. 2. Thus, in operation, when the shaft 34 is rocked counterclockwise. the arms 32 and 50 move as a unit with the jaws 36, 38 in their open position until the lower jaw 36, fixed to the arm 32, comes into engagement with the side of the block 10, as illustrated in Fig. 3. During this movement the curved folding blade 26 has folded the extension 24 across the upper surface of the horizontal block 10 to present the marginal edge in engagement with the marginal edge of the extension 22. The folding blade 26 is advanced until it comes into cooperative engagement with the angularly disposed surface 40 of the lower jaw 36 to effect folding of the marginal edges in face to face relation against the lower jaw, as illustrated in Fig. 3. Upon continued movement of the arm 50. the pivotally mounted upper jaw 38 is moved into cooperative engagement with the lower jaw 36 to apply heat and pressure to seal the edges together as shown in Fig. 4, to form a longitudinal side seam 35. The folding blade is retracted slightly immediately prior to the engagement of the jaws, and upon completion of the sealing operation both arms 28 and 32 are rocked outwardly to their elevated positions where they remain at rest until a succeeding block 10 is intermittently moved into operative position to receive a succeeding blank, as above described.



During the return stroke of the seam pressing and sealing mechanism, the arm 50 first effects opening of the jaws, the jaw 36 remaining in engagement with the block by virture of the spring connection 60, until the stop members 68, 69 engage each other whereupon the loosely mounted arm 32 is lifted up to the position shown in Fig. 1.

Provision is also made for retaining the blank in firm engagement with the sides of the forming block adjacent the upper edges thereof during the side seam forming operation. As herein shown, the arm 28 is provided with a corner engaging member 72 formed on the end of a curved slide member 74 slidably mounted in guides 75 attached to the rocker arm 28. The corner engaging member 72 is arranged to engage and retain the liner in tight engagement with the upper right hand edge of the block during the folding operation. As herein shown, springs 76 connected to the folding plate 26 and the slide member 74 urge the latter into an extended position with relation to the folding plate, being limited by the engagement of a stop bar 78 with the end of the outer guide 75. Thus, in operation, the corner engaging member 72 is first brought into engagement with the block to hold the lining firmly in place during the folding operation, and remain in such engagement until the folding plate is retracted so that the upper right hand edge of the lining as viewed in Fig. 3 is not affected by the movement of the folding plate during withdrawal. As herein shown, the block engaging portion 80 of the lower sealing jaw 36 likewise serves to retain the blank firmly against the upper left hand edge of the block during the sealing operation.

The rocker shafts 30, 34 are mounted in bearings formed in a bracket 82 supported upon a cross bar 84 attached to the machine frame and are arranged to be rocked in timed relation to the operation of the intermittently movable blocks 10 through connections including levers 86, 88 fast on the shafts 30, 34 respectively. The lever 86, 88 may be connected by links 90, 92 respectively to operating cams, not shown, and through connecting linkage similar to that illustrated and described in the Hesser Patent No. 1,020,821 above referred to.

Referring now to Fig. 1, the liner bag forming operation above described is performed at the station indicated generally at 101, and, in the continued operation of the machine, the portions of the blank extended beyond the forming block may be folded and sealed over the bottom of the block in any usual or preferred manner to form the bottom closure for the lining bag at the station indicated at 102. Thereafter, the forming block is intermittently moved to the next station 103, at which station the outer carton or wrapper 100 is applied over the liner bag on the block in the usual manner, the portions forming the side seam of the carton being adhesively secured in overlapping relation. During the latter operation the angularly extended lining seam 35 is folded against the upper surface of the block, as shown in Fig. 5. At this time a longitudinal side seam pressing member 109, arranged to travel along with the block, is moved into pressing engagement with the overlapping side seam of the carton to set the seal. The block is then moved to station 104 where provision is made for folding the bottom of the carton and at the next station, 105, pressure may be applied to the end of the block by a presser member 110 to set

the bottom seal. Station 106 is idle and station 107 may comprise the discharge station where provision is made for raising the side seam presser 109 while the completed lined container is stripped from the block by the usual form of stripping mechanism indicated generally at 112 to be delivered from the machine on a conveyer 114.

From the above description it will be observed that the present container forming mechanism enables an efficient face to face or fin type seam to be produced in the lining of the container while supported upon a forming block or mandrel. Although the mechanism for producing the fin type seam has been illustrated and described herein as embodied in a machine for forming a seam in a heat sealable paper by the application of heat and pressure, it will be apparent that the present pressure jaw mechanism may be employed with advantage for pressing together the marginal edges of other types of lining material which have been previously provided with strips of adhesive along the longitudinal marginal edges thereof.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. In a container forming machine of the character described, in combination, a forming block about which a blank of lining material may be wrapped to form a lining bag, means for folding the longitudinal marginal edges of the thus wrapped blank into face to face relation with the marginal edges adjacent and projecting from a longitudinal edge of the block, and means for applying pressure to said marginal edges to form an outwardly projecting seam.

2. In a container forming machine of the character described, in combination, a forming block about which a blank of heat sealable lining material may be wrapped to form a lining bag, means for folding the longitudinal marginal edges of the thus wrapped blank into face to face relation and with marginal edges adjacent and projecting from a longitudinal edge of said block, and means for applying heat and pressure to said face to face marginal edges to form an outwardly projecting seam.

3. In a container forming machine of the character described, in combination, a forming block about which a blank of lining material may be wrapped to form a lining bag, means for folding the longitudinal marginal edges of the thus wrapped blank into face to face relation with the marginal edges adjacent and projecting from a longitudinal edge of the block, and means for applying pressure to said marginal edges to form an outwardly projecting seam, said pressure applying means including a rockingly mounted arm, a lower jaw fixed on said arm and having a portion engageable with the forming block adjacent the said edge thereof, an upper cooperating jaw pivotally carried by said arm for pivotal movement thereon toward and from said lower jaw, spring means for normally maintaining said jaws in their open position to receive the portions to be sealed, and means engaging said upper jaw to effect movement of said arm toward said block and thereby effect closing of the jaws upon engagement of said lower jaw with the forming block and against the resistance of said spring means.

4. In a container forming machine of the character described, in combination, a forming block about which a blank of lining material may be wrapped to form a lining bag, means for folding the longitudinal marginal edges of the thus wrapped blank into face to face relation with the said edges projecting outwardly from the block, and means for applying pressure to said marginal edges to form an outwardly projecting seam, said pressure applying means including a pivotally mounted arm, a first jaw fixed on said arm and having a portion engageable with the forming block adjacent said outwardly projecting marginal edges, a second jaw movably carried by said arm for movement toward and from said first jaw, means including a spring for normally maintaining said second jaw spaced from said first jaw, and means for applying a force to said second jaw tending to urge said second jaw toward said first jaw and said first jaw toward said block.

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