Aug. 11, 1964 C. W. BARR 3,143,837

CONTAINER SEALING MACHINE

Filed Sept. 26, 1960 4 Sheets-Sheet 1

Fig. 1

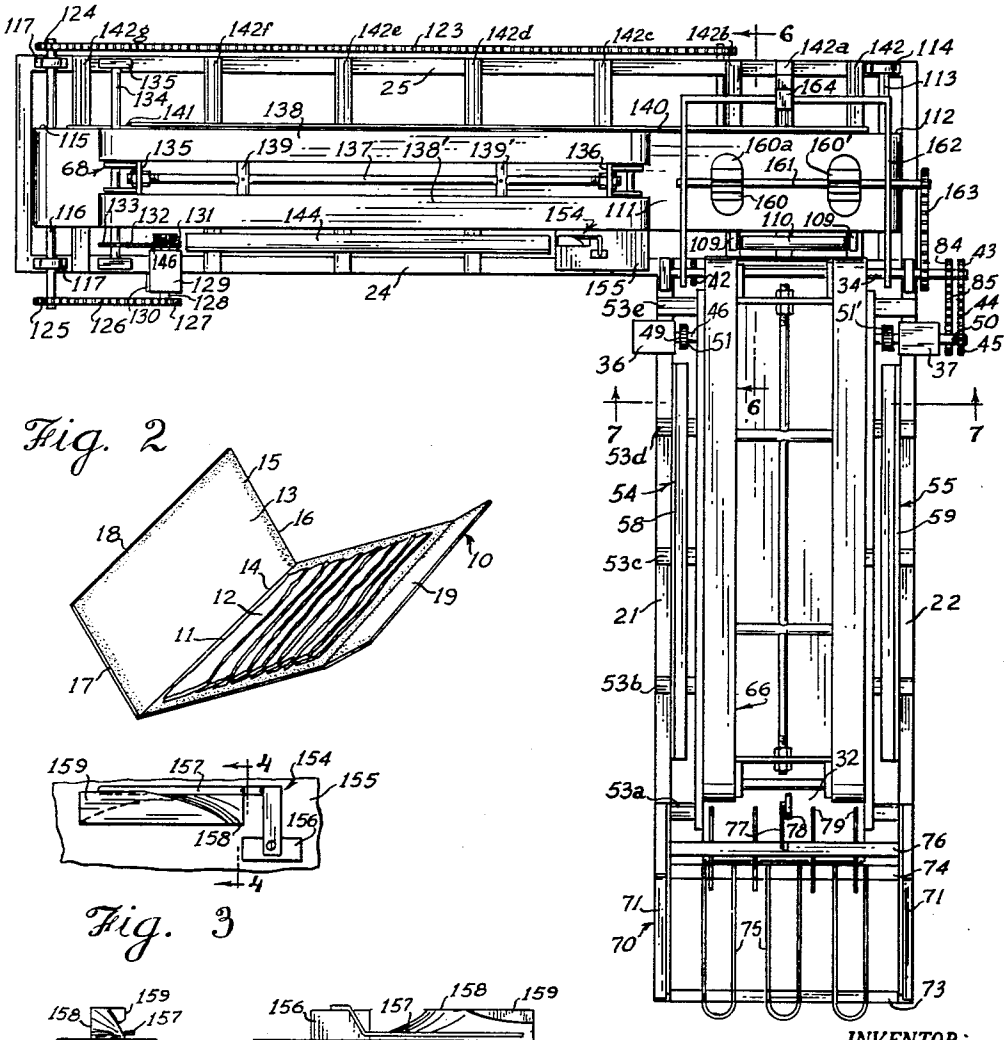


Fig. 2

Fig. 3

Fig. 4

Fig. 5

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CONTAINER SEALING MACHINE

Filed Sept. 26, 1960 4 Sheets-Sheet 2

Fig. 6

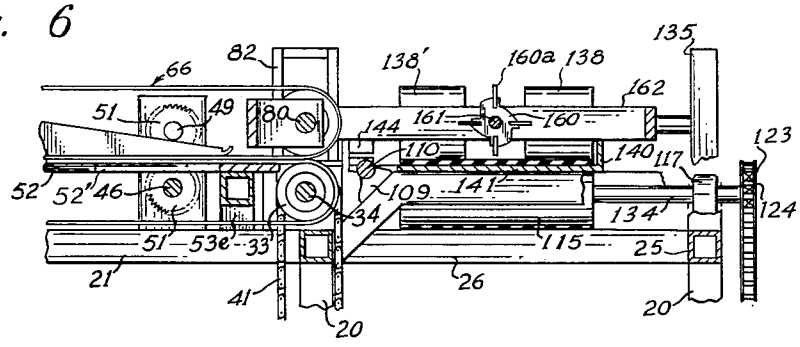


Fig. 7

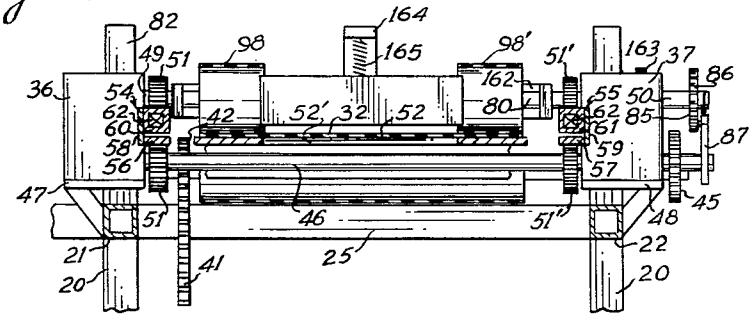


Fig. 8

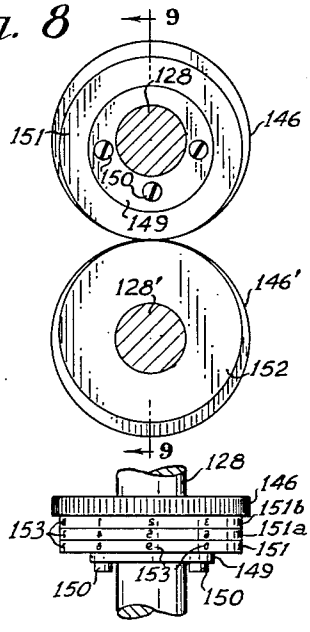


Fig. 9

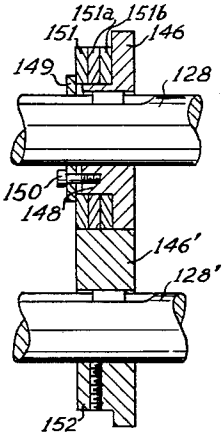


Fig. 10

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Aug. 11, 1964 C. W. BARR 3,143,837

CONTAINER SEALING MACHINE

Filed Sept. 26, 1960 4 Sheets-Sheet 3

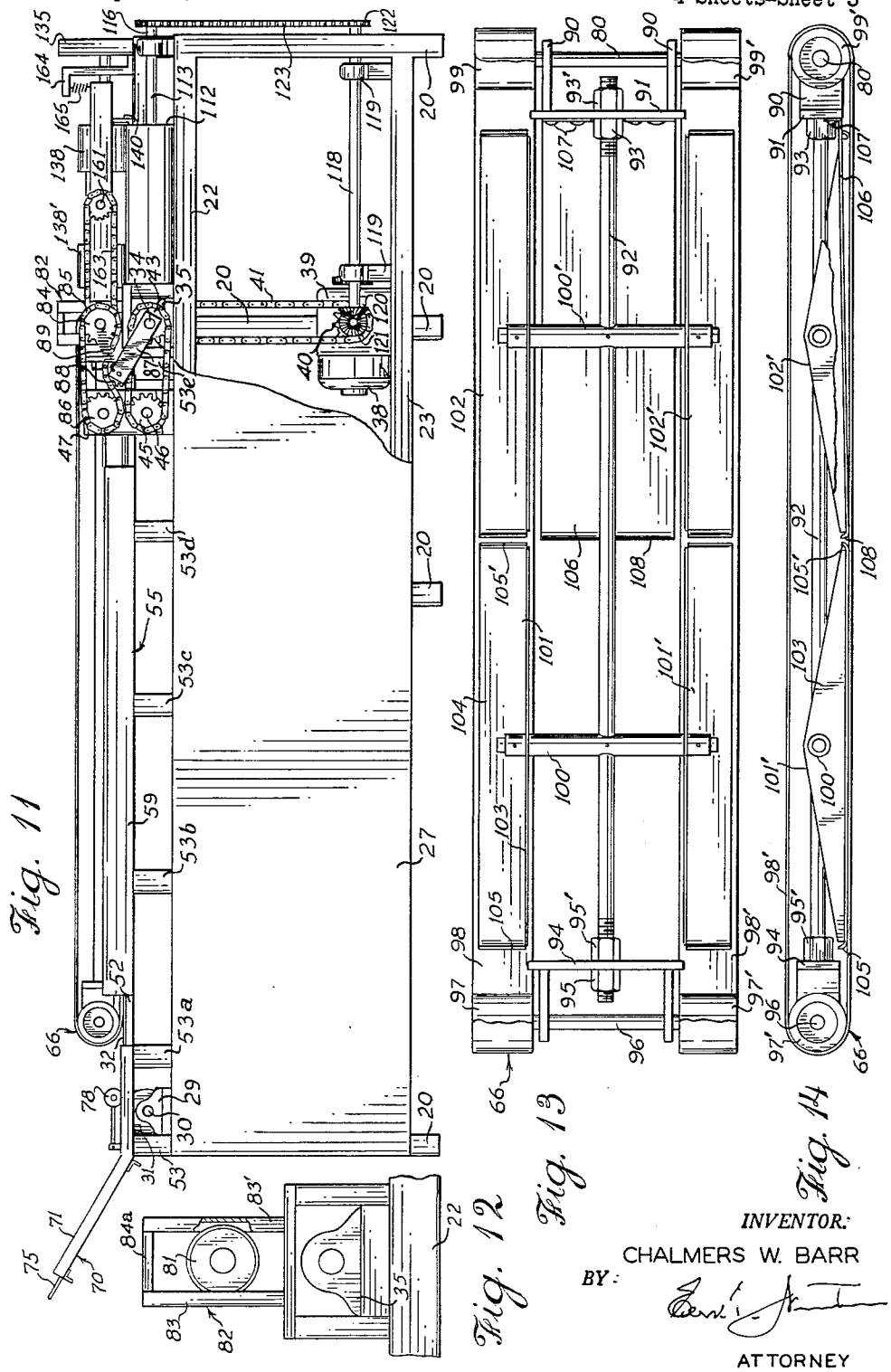


Fig. 11

Fig. 12

Fig. 13

Fig. 14

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Aug. 11, 1964 C. W. BARR 3,143,837

CONTAINER SEALING MACHINE

Filed Sept. 26, 1960 4 Sheets-Sheet 4

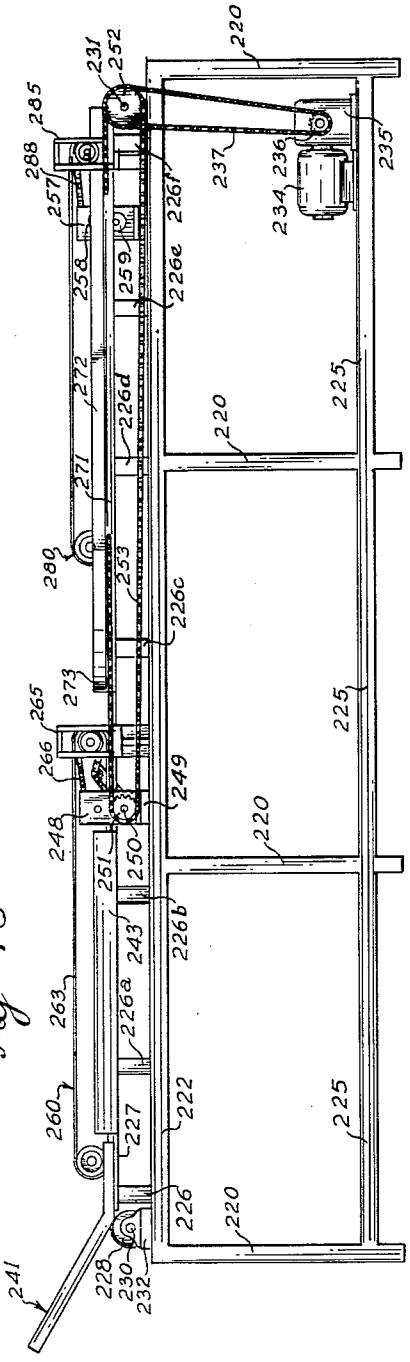


Fig. 15

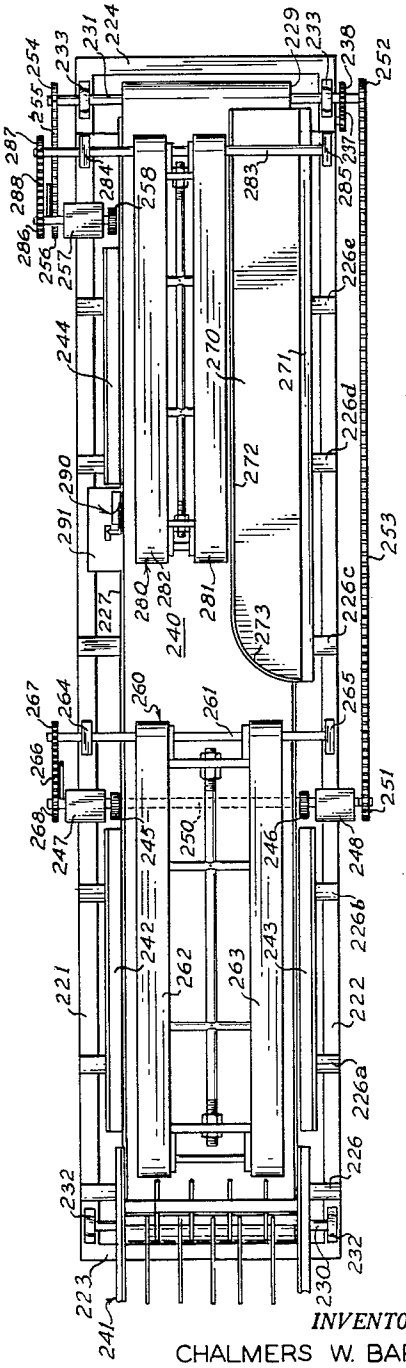


Fig. 16

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United States Patent Office 3,143,837 Patented Aug. 11, 1964

3,143,837

CONTAINER SEALING MACHINE

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Filed Sept. 26, 1960, Ser. No. 58,259
9 Claims. (Cl. 53—373)

This invention relates to a container sealing machine and is more particularly concerned with a machine for sealing successively, angularly disposed edge portions of containers, such as wrappers for containing bacon and the like.

In the past, a tremendous number of bacon wrappers have been used throughout the United States. These bacon wrappers have been formed of cardboard or paper or fibre board, cut and scored to provide overlapping flanges on two or more sides. In the conventional packaging of bacon, the staggered slices, approximating one pound, have been placed by hand on the base portion of the prior art bacon wrapper and the flanges were then folded, by hand, over the ends or sides of the pile of bacon, the two opposed flaps being joined together by inserting, again by hand, a tongue or edge of one flap through an opening or slot in the other flap. Next a transparent heat sealable film was wrapped around the wrapper and sealed either by hand or by machine. It is obvious that to complete the packaging of such prior art bacon wrappers a relatively large amount of hand labor was required. A long felt need, therefore, has arisen for a machine which automatically seals the bacon wrapper.

In my copending application, Serial No. 770,094, filed October 28, 1958, and entitled "Food Container and Process of Sealing the Same," now Patent No. 2,996,236, I have disclosed a type of bacon wrapper which includes a wrapper member formed from a substantially rectangular blank cut and scored to provide a base and a single flap to overlie the entire base, the flap being substantially coextensive with the base so that upon being folded, the adhesive strips on the inner surface of the three side portions of the perimeter of the flap register with the adhesive strips on the three side portions of the perimeter of the base and there is a common fold line forming the fourth side portion. In such a wrapper the opposite side portions are parallel to each other and perpendicular to the adjacent side portions.

When bacon is placed in the bacon wrapper of my copending application, the wrapper is sealed by the application of heat and pressure on the outer surfaces of the three side portions, the heat and pressure being transferred to the registering adhesive strips causing the same to adhere together.

The apparatus of the present invention is particularly adapted to seal automatically wrappers for bacon and other items, as my above described bacon wrapper, wherein at least two edges to be sealed are provided, the edges being angularly and preferably perpendicularly disposed with respect to each other. The apparatus of my invention, briefly described, includes a frame or supporting structure on which are carried a pair of angularly disposed main or primary conveyors, one conveyor being the infeed conveyor and the other being the discharge conveyor. The infeed conveyor receives from a wrapper folding chute and feeds successive relatively flat wrappers along a predetermined path wherein the opposite edges of the wrapper are heated by heating elements and then engaged by opposed pairs of knurled sealing rollers which apply pressure to the heat sealable material between the edges of the wrappers. Thence the infeed roller successively discharges the wrappers onto the end of the discharge conveyor across the path of travel of the discharge conveyor so that each wrapper is urged in its discharge path in a perpendicular direction to the infeed path or direction previously travelled. In this path are additional heating elements which heat the adhesive material of the yet unsealed sides or edges of the wrappers. Thereafter, opposed pairs of knurled sealing rollers engage these sides of each wrapper to complete the sealing operation and the wrapper is discharged.

In the process above described, the wrappers should be firmly but resiliently held down against the conveyor so that the edges will be maintained in appropriate position for engagement with the heating elements and sealing rollers while, at the same time, being readily accessible in the event the wrappers become misaligned or improperly folded. For these purposes, auxiliary conveyor assemblies are provided over the main or primary conveyors. The auxiliary conveyor assemblies each have shoes which tend to flatten the wrappers and auxiliary conveyors which are synchronized with their respective main conveyors to urge the wrappers along the predetermined paths, the auxiliary conveyors being driven from drive shafts which support for pivotal movement in a vertical plane the auxiliary conveyor assemblies. Also provided on my device is an alignment plate adjacent one edge of the infeed end of the discharge conveyor, the alignment plate cooperating with the wrapper centering member so that, as each wrapper is transferred to the discharge conveyor from the infeed conveyor, it is engaged by the wrapper centering member and urged against the alignment plate, thereby being properly positioned for movement by the discharge conveyor.

The present invention also includes a modified form of machine which has a single main conveyor and a pair of auxiliary conveyors in tandem. The bacon wrappers carried by the infeed conveyor pass first beneath the first auxiliary conveyor, the opposed edges being sealed by heat sealing elements on opposite sides of the first auxiliary conveyor and being pressed closed by rollers thereafter. As the wrappers carried by the main conveyor emerge from beneath the first auxiliary conveyor, they successively engage, by one corner, a camming surface which turns the wrappers about 90° whence the wrappers successively pass beneath the second auxiliary conveyor. While under the second auxiliary conveyor, each wrapper's edge between the previously sealed edges is first heated and then sealed as aforesaid.

If the bacon wrapper is provided with a flange or tab on its front edge of the flap, a turning member turns this edge over the flap, prior to the heat sealing thereof.

The machines also include a dating roller by which the date is stamped on the wrapper.

Accordingly, it is one of the primary objects of the present invention to provide a container sealing machine which will eliminate much of the hand labor required in packaging a unit of sliced bacon.

Another object of the present invention is to provide a container sealing machine which is inexpensive to manufacture, durable in structure and efficient in operation, the machine being capable of successively sealing angularly disposed edges of relatively flat wrappers.

Another object of the present invention is to provide a container sealing machine which will fold a flange of a wrapper over its base along a common fold line so as to enclose the contents therebetween and then automatically seal the three remaining side portions thereof by the application of heat and pressure thereto.

Another object of the present invention is to provide a container sealing machine in which successive containers are sealed and wherein any container is readily accessible and may be removed readily and easily without affecting the operation of the machine with respect to the other containers.

Another object of the present invention is to provide a container sealing machine which is equally effective for sealing a plurality of containers fed to the machine sequentially in small batches or fed continuously thereto.

Another object of the present invention is to provide a container sealing machine which will, in the same operation, seal and date a wrapper.

Other objects, features and advantages of the present invention will become apparent from the following description when taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts and wherein:

FIG. 1 is a plan view of one form of a container sealing machine constructed in accordance with the present invention.

FIG. 2 is a perspective view of a bacon wrapper containing bacon and suitable for sealing in the machine of FIG. 1.

FIG. 3 is an enlarged fragmentary plan view of a detail of FIG. 1 showing the flange turning member thereof.

FIG. 4 is a cross sectional view taken along line 4—4 in FIG. 3.

FIG. 5 is a side elevational view of that portion of the machine shown in FIG. 3.

FIG. 6 is an enlarged vertical-sectional view taken along line 6—6 in FIG. 1.

FIG. 7 is an enlarged vertical-sectional view taken along line 7—7 in FIG. 1.

FIG. 8 is an enlarged cross sectional view of the dating and sealing rollers which may be employed in the machine shown in FIG. 1.

FIG. 9 is a cross sectional view taken along line 9—9 in FIG. 8.

FIG. 10 is a plan view of the dating rollers shown in FIG. 8.

FIG. 11 is an enlarged partially broken away side elevational view of the machine shown in FIG. 1.

FIG. 12 is an enlarged partially broken away view of the floating bearing assembly of the machine illustrated in FIG. 1.

FIG. 13 is an enlarged partially broken away plan view of the auxiliary conveyor assembly of the machine shown in FIG. 1.

FIG. 14 is a side elevational view of the auxiliary conveyor assembly of FIG. 13.

FIG. 15 is a side elevational view of a modified form of the present invention.

FIG. 16 is a plan view of the machine illustrated in FIG. 15.

Referring now in detail to the embodiments chosen for the purpose of illustrating the present invention and particularly to FIG. 2 of the drawings, numeral **10** denotes generally a bacon wrapper or container suitable for being sealed in the present machines. Wrapper **10** includes a flat base **11** formed of fibre board supporting a pound of sliced bacon **12**. The wrapper **10** is also provided with a flap **13** integrally secured to the base **11** along a common edge forming a fold line **14**. The perimeter of the wrapper **10** including the flap **13** and base **11** is provided with heat and pressure sensitive adhesive **15**, the flap **13** being coextensive with the base **11** so that upon being folded over the bacon **12**, and upon the application of heat and pressure adjacent the opposed edges **16** and **17** and the outer edge **18**, the adhesive seals to flap **13** in place over the base **11** and encloses the bacon **12**. A flange **19** is provided on the outer edge of base **10** for folding over outer edge **18** of flap **13** and forms a convenient handle by which the wrapper **10** may be opened or closed after once being opened.

While the above described wrapper **10** is particularly suited for being sealed automaticaly in my sealing machine, it will be obvious that other similar wrappers may also be sealed thereby.

In FIGS. 1, 6, 7 and 11, it will be seen that my sealing machine includes a frame formed of structural steel and including a plurality of upstanding standards **20**, the lower ends of which are supported by a floor or other horizontal surface. Joining the upper ends of the standards **20** are the longitudinally extending, inner and outer spaced parallel infeed runners **21** and **22** of the infeed portion of my machine. Spaced below and parallel to the runners **21** and **22** are the reinforcing runners, such as runner **23**, the ends of which are connected to intermediate portions of the standards **20**. The opposed ends of standards **20** also support inner and outer outfeed runners **24** and **25** which extend in the same horizontal plane with the infeed runners **21** and **22** but perpendicular thereto, the inner ends of runners **24** and **25** being respectively joined to the inner ends of runners **21** and **22**. A cross bar **26** joins the outer ends of runners **24** and **25**; and metal panels, such as panels **27** in FIG. 11, are provided over the outer surfaces of the framework thus formed, so as to prevent the accumulation of dirt within this framework.

It is therefore seen that an L-shaped supporting frame structure having a flat horizontal upper surface is provided on which the operating mechanism of the present invention is mounted.

Referring now to FIG. 11, a pair of opposed upstanding pillow blocks, such as block **29**, are mounted on the runners **21** and **22** adjacent the outer ends thereof, the pillow blocks **29** journalling, therebetween, a horizontal conveyor shaft **30**. An infeed roll **31** is carried by shaft **30** between the pillow blocks **29** and an endless infeed conveyor belt **32** passes around the roll **31**, the upper and lower flights of belt **32** passing inwardly and around an infeed drive roll **33**, seen in FIG. 6. Roll **33** is carried by an infeed conveyor drive shaft **34** which, in turn, is journalled by pillow blocks, such as block **35** supported from the runners **21** and **22**. Belt **32** is slightly smaller in width than the length of wrapper **10** so that the edges of the wrapper **10** will project beyond both edges of belt **32** when received thereon.

For rotating shaft **34** there is mounted, below the shaft **34** in the frame structure, a motor **38** seen in FIG. 11 which drives a gear reducer **39**, the gear reducer **39** having a sprocket **40** driving through chain **41** a sprocket **42** on shaft **34**. Thus, upon rotation of motor **38**, shaft **34** will be rotated.

Mounted on the outer portion of shaft **34**, for rotation therewith, is a sprocket **43**, driving an endless chain **44**, the chain **44** being looped around a sprocket **45**. Sprocket **45** is carried by one end of shaft **46** and the shaft **46** is journalled in a pair of spaced gear boxes **36** and **37** which are mounted on platforms **47** and carried by the runners **21** and **22**, respectively. Inwardly projecting stub shafts **49** and **50** are also carried by the gear boxes **36** and **37**, the shafts **49** and **50** being spaced above and parallel to shaft **46** and being driven at the same speed as shaft **46** by the internal gears (not shown) of the gear boxes **36** and **37**.

It will be observed in FIG. 7 that shaft **46** extends transversely of and below the upper flight of conveyor belt **32** and that shafts **49** and **50** are parallel to shaft **46** above the upper flight of conveyor belt **32**, the shafts **46**, **49** and **50** being adjacent infeed roll **33**. Mounted on shafts **46** and the inner ends of shafts **49** and **50**, adjacent the opposed edges of the upper flight of belt **32**, are the means for applying pressure to the edges of the wrapper, such as intermeshing fluting rollers **51**, **51'**.

Immediately below and supporting the upper flight of conveyor belt **32** is a flat rectangular metal supporting plate or sheet **52** having a central opening **52'** and over which the upper flight of conveyor belt **32** travels. The purpose of central opening **52'** is to permit the central portion of belt **32** to sag slightly to accommodate the bulky central portion of wrapper **10**. The supporting plate **52** extends inwardly adjacent roll **33** and is slightly

wider than belt 32. A plurality of spaced, inverted U-shaped transverse brackets 53, 53*a*, 53*b*, 53*c*, 53*d* and 53*e* which extend upwardly from the upper surfaces of runners 21 and 22 support in a horizontal position the sheet 52 and extend outwardly on opposite sides thereof as seen in FIG. 1.

Outwardly adjacent the opposed side edges of the plate 52 are the opposed, longitudinally extending heating elements 54 and 55 which are adapted to receive the protruding side edges 16 and 17 of the folded bacon wrapper 10 carried by conveyor belt 32 and heat the same, as the bacon wrapper 10 is conveyed inwardly. The heating elements 54 and 55 include respectively slide bars 56 and 57 mounted over the brackets 53*b*, 53*c* and 53*d*, parallel to and spaced from the edges of plate 52. Upstanding flange plates 58 and 59, which are secured to the outer edges, respectively, of the slide bars 56 and 57, support the hollow rectangular heaters 60 and 61 over and spaced slightly above the slide bars 56 and 57. Within each heater is an electrical heating coil, such as coil 62, connected appropriately to a source of electrical current.

It is therefore seen that the heating elements 54 and 55 provide a pair of opposed inwardly opening longitudinal slots for receiving edges 16 and 17 of bacon wrapper 10, these slots being in substantially the plane of the upper surface of the upper flight of conveyor belt 32 and aligned with and outwardly adjacent the junction of the fluting rolls 51, 51'.

For feeding the bacon wrappers 10 in a closed condition to the conveyor belt 32, there is provided a wire frame chute 70 at the front end of the infeed conveyor, which chute 70 includes a pair of spaced opposed dog leg shaped angled irons 71, the horizontal portions of which extend longitudinally and are secured to the upper surfaces of brackets 53 and 53*a*. In cross section the vertical portions of the angle irons 71 form guides and are spaced apart by a distance slightly greater than the width of conveyor belt 32, while the horizontal portions extend outwardly. Above the roll 31, the angle irons 71 extend upwardly and outwardly, being provided, therebetween, with spaced transverse slats 73 and 74. The slats 73 and 74 support a plurality of spaced rods 75 which form an inclined chute terminating at the surface of belt 32 on which the bacon wrappers 10 are placed.

Above the slat 74 is another slat or bar 76, also supported by angle irons 71. Extending inwardly from the central part of bar 76 is pivotally mounted roller carrying arm 77 provided at its free end with a vertically disposed presser wheel 78 which engages the central surface of belt 32 and is rotated when belt 32 is actuated. Spaced parallel holddown fingers 79 also extend longitudinally inwardly and outwardly from bar 76, the outwardly extending finger portions lying essentially parallel to and above the rods 75, and the inwardly extending portions lying parallel to and above the forward portion of belt 32.

Thus it is seen that when a bacon wrapper 10 is fed into the machine it passes between the rods 75 and fingers 79 and thence onto the belt 32, passing beneath fingers 79 and roller 78.

The auxiliary infeed conveyor assembly, denoted generally by numeral 66 and seen most clearly in FIGS. 13 and 14, includes a shaft 80 above and parallel to shaft 34, the shaft 80 being journalled by floating bearings, such as bearing 81 in FIG. 12, carried by bearing blocks 82. The floating bearings 81 permit limited vertical movement of the shaft 80. As best seen in FIG. 12, each bearing block 82 includes a pair of complementary, vertically disposed channel members 83, 83' which are mounted on the pillow blocks 35, the upper ends of the channel members 83, 83' being joined by a cross bar 84*a*. It will also be seen in FIG. 12 that the bearing 81 is of smaller diameter than the distance between the webs of the channel members 83, 83' and of greater diameter than the distance between the flanges thereof. Thus, while the bearing 81 is free to move for a limited distance vertically, substantial horizontal movement or twist of the bearing within the bearing block 82 is precluded.

The shaft 80 protrudes beyond one of the bearing blocks 82 and is provided, outwardly thereof, with a sprocket 84 around which is trained a loose endless chain 85, driven by a sprocket 86 on the outwardly protruding end of shaft 50. The slack in chain 85 may be taken up by a lever 87 pivotally connected to shaft 34 and having an idler sprocket 88, the lever 87 being urged in a clockwise direction by a spring 89 so as to urge the idler sprocket 88 upwardly against chain 85 between the sprockets 84 and 86.

As best seen in FIG. 13, centrally of the shaft 80 is a U-shaped yoke, the parallel arms 90 of which are provided with aligned apertures which rotatably receive shaft 80. The central bar 91 of the yoke has a central hole through which projects one end of compression arm 92, the arm 92 being held in place by lock nuts 93, 93' threadedly carried by the arm 92 on opposite sides of bar 91.

A yoke 94, similar to the preceding yoke, is provided on the opposite end of arm 92 and is held in place for slight pivotal movement thereon by nuts 95, 95'. The arms of yoke 94 journal a transversely disposed shaft 96 which is provided, outwardly of the yoke 94, with idler rollers 97, 97'. A pair of endless auxiliary conveyor belts 98, 98' loop around the rollers 97, 97' and loop around similar rollers 99, 99' on the shaft 80, the belts 98, 98' being driven by the rollers 99, 99' upon rotation of shaft 80. The width of the conveyor belts 98, 98' and the spacing thereof are such that the outer edge of belt 98 terminates in the vertical plane of the edge of belt 32 and the outer edge of belt 98' in the vertical plane of the opposite edge of belt 32.

Spaced cross bars 100, 100' extend diametrically from intermediate portions of compression arm 92, the cross bar 100 at its ends being provided with complementary shoes 101, 101' and the cross bar 100' with shoes 102, 102'. Each shoe 101, 101', 102, 102' includes a vertically disposed supporting flange, such as flange 103, having a hole in the upper portion thereof through which its cross bar, such as cross bar 100, projects and a flat outwardly projecting horizontally disposed platen plate, such as plate 104, with upwardly turned forward and rear ends 105, 105'. The platen plates, such as plate 104, of the shoes 101 and 102 are aligned, relatively long members, slightly more narrowed than the belt 98 so as to cover a substantial portion of the inner surface of the lower flight of belt 98 and urge the belt 98 against one side portion of belt 32. Similarly, the platen plates of shoes 101' and 102' urge belt 98' into engagement with the other side portion of belt 32.

It will now be seen that the belts 98, 98' of the auxiliary conveyor assembly 66 normally rest upon the main infeed conveyor belt 32, and are driven through shaft 80 in a counterclockwise direction, as seen in FIG. 5, while the belt 32 is driven in a clockwise direction at substantially the same linear speed therewith. Thus, the lower flight of the conveyor belts 98, 98' engage the upper surfaces of the wrappers 10 as the wrappers 10 are carried by belt 32 inwardly, the shoes 101, 101', 102, 102' being sufficiently pivotal that the lower flight of belts 98, 98' engage the upper surface of wrapper 10 regardless of variation in its contour.

For assuring that the infeed wrappers 10 pass beneath the central bar 91, a flat plate 106 is secured by one end with rivets 107 to the central bar 91, the flat plate 106 projecting between the shoes 102, 102' and beneath the compression arm 92 and having an upturned free end 108.

It will be understood that the shaft 80 is the sole element which retains the auxiliary conveyor assembly 66 in place over the main conveyor belt 32, and therefore, the auxiliary conveyor assembly may be lifted, pivoting

about shaft 80 so that access may be had to substantially any portion of the upper flight of conveyor belt 32.

It will also be understood that as the conveyor belts 32, 98, 98' move the successive wrappers 10 inwardly, the opposed edges of the wrappers ride in the slots of the heating elements 54 and 55 so that the adhesive thereon is heated. As the wrappers 10 are about to be discharged from the infeed conveyor, the edges which have been heated pass between the rollers 51, 51' and therefore pressure is applied to the adhesive to seal the same.

At the end of the infeed conveyor is a guide roller 110 supported by pillow blocks 109 in parallel relationship to roll 33, over which roller 110 each wrapper 10 passes as it is discharged from between the belts 32, 98, 98' and thence onto the upper flight of an outfeed conveyor belt 111 arranged in a horizontal plane (slightly below the plane of the upper flight of the conveyor belt 32). The outfeed conveyor belt 111 is arranged normal to the infeed conveyor belt 32 with one edge of the upper flight traveling parallel to and adjacent the entire roller 110 so that the wrappers 10 are thence moved normal to their first path of travel on belt 32. For this purpose, the outfeed conveyor belt 111 passes around an idler roller 112 on shaft 113, the shaft 113 being journalled by pillow blocks, such as block 114, on the inner end portions of runners 24 and 25. Thence, the conveyor belt 111 extends outwardly, passing around a drive roller 115 carried on shaft 116, the shaft 116 being journalled by pillow blocks 117 on the outer end portions of runners 24 and 25.

For transferring power to drive shaft 116 and thereby actuate the outfeed conveyor belt 111, I have provided a shaft 118, seen in FIG. 11, supported by bearing blocks 119 from the reinforcing runners, such as runner 23. The inner end of shaft 118 carries a bevelled gear 120 which meshes with a complementary bevelled gear 121 on the gear reducer 39. The outer end of shaft 118 contains a sprocket 122 driving through chain 123 a sprocket 124 on shaft 116.

The opposite end of shaft 116 is provided with a sprocket 125 which drives through chain 126 a sprocket 127 on shaft 128 of a gear box 129 supported adjacent runner 24 by a platform 130. The shaft 128 projects through the gear box 129 and carries, on its inner end, a sprocket 131, the sprocket 131 driving through chain 132 a sprocket 133 on shaft 134. Shaft 134 is supported for rotation by bearing blocks 135 on runners 24 and 25 and is parallel to, above and slightly inward of shaft 116.

Extending inwardly over the conveyor belt 111, so as to terminate intermediate the ends thereof, is an auxiliary conveyor assembly 68 substantially identical to the previously described auxiliary conveyor 66, the shaft 134 corresponding to shaft 80 thereof. Briefly, this second conveyor assembly 68 includes a bearing yoke 135 and an idler roller supporting yoke 136, having extending therebetween a compression arm 137 and carrying spaced auxiliary conveyor belts 138, 138' having shoes (not shown) carried by cross bars 139, 139'. The second auxiliary conveyor assembly 68 is pivotable about shaft 134 for providing access to belt 111; however, the second auxiliary conveyor assembly 68 issubstantially narrower than the first auxiliary conveyor assembly so as to conform to the width of the outfeed conveyor belt 111.

As best seen in FIGS. 1 and 6, a guide flange 140 is arranged adjacent the outer edge of belt 111, the flange 140 being an upturned integral part of a flat metal sheet or plate 141 on which the upper flight of conveyor belt 111 travels, the sheet 141 being supported on spaced inverted U-shaped brackets 142, 142*a*, 142*b*, 142*c*, 142*d*, 142*e*, 142*f* and 142*g* which extend transversely from and above the runners 24 and 25. It will be noted that brackets 142, 142*a* and 142*b* have angularly disposed legs which support the pillow blocks 104.

Adjacent the inner edge of sheet 141 and adjacent the opposite edge of belt 111 from the guide flange 140, the brackets 142*c*, 142*d*, 142*e* and 142*f* support a heating element 144 similar to the heating element 54, the heating element being aligned longitudinally of the outfeed conveyor and being provided with a slot for receiving and heating the remaining unsealed edges of wrapper 10.

The heating element 144 terminates short of the gear box 129 whereby intermeshing fluting rollers 146, 146' on the ends of a pair of vertically spaced shafts 128, 128' receive therebetween the remaining unsealed edge of wrapper 10 after the same has been heated by the heating element 144. It will be understood that the gear box 129, its shafts 128, 128' and the intermeshing fluting rollers 146, 146' operate similarly to the gear box 36, its shafts 46 and 49 and its intermeshing fluting rollers 51, 51'; however, the roller may be provided with a means for stamping the date on the wrappers 10.

If it is desired to provide a date stamp, the outer face of roller 146 is reduced as seen in FIGS. 8, 9 and 10 to provide an integrally formed, eccentrically disposed hub 148 with a keeper plate 149 secured to the outer surface of hub 148 by bolts 150. A plurality of concentric rings or annular marking plates 151, 151*a*, 151*b* are received on the hub 148 in juxtaposition with respect to each other and roller 146. The diameter of plates 151, 151*a* and 151*b* are slightly less than the diameter of roller 146; however, the eccentricity of hub 148 with respect to roller 146 positions a small of the periphery of plates 151, 151*a*, 151*b* in alignment with a small portion of the periphery of roller 146. Likewise, the roller 146' is provided with an eccentric hub 152 having a smaller diameter than roller 146'; however, this eccentric hub 152 is approximately the diameter of plates 151, 151*a*, 151*b* and hence has a small peripheral portion in alignment with a peripheral portion of roller 146'. The rollers 146, 146' are so arranged on shafts 128, 128' that the aforesaid peripheral portions of plates 151, 151*a*, 151*b* engage each other upon each rotation of the shafts 128, 128' whereby pressure is extended therebetween.

Each plate 151, 151*a*, 151*b* is provided with appropriate raised indicia 153 along its periphery for the proper coding of a date, and the plates 151, 151*a*, 151*b* may be rotated on hub 148 upon loosening of bolts 150 so as to selectively arrange these indicia for engagement with hub 152. When the wrapper 10 passes between the rollers 146, 146', the rollers 146, 146' rotate at least one revolution because the circumference of the rollers 146, 146' is less than the linear width of wrapper 10. Thus, at one portion, the indicia 153 press into the wrapper 10 and emboss the code thereon.

Inwardly adjacent the opposite end of heating element 144 and aligned longitudinally therewith is a turning element, denoted generally by numeral 154, the purpose of the turning element 154 being to progressively turn the flange 19 of wrapper 10 so as to overlap the flap 13. The turning element 154 is supported by a platform 155 extending from sheet 141 and includes an upstanding member 156 carrying an inwardly and downwardly projecting L-shaped hold-down finger 157, the free end of which is arranged parallel to and adjacent the edge of conveyor belt 111. The function of finger 157 is to hold down the outer edge of base 11 and flap 13 of wrapper 10 as it passes. Outwardly adjacent the finger 157 is a folding plate 158 having an upwardly and inwardly inclined inner face with an overhanging lip portion 159 so that as the wrapper 10 with its flange 19 protruding beyond finger 157 is moved along by conveyor belt 111, the flange 19 is first progressively lifted by the inclined portion of plate 158 pivoting it about finger 153 and then is urged downwardly by the lip 159 of plate 158 as the wrapper clears finger 153.

To assure proper alignment of the wrapper 10 as it is discharged from belt 32 to belt 111, i.e., to urge the leading edge, namely the common fold line 14, against the guide flange 140, in the central portion of the machine I have provided a centering member including a plurality of paddles 160, 160' carried by a common shaft 161 sup-

ported for rotation intermediate the ends of the arms of a U-shaped frame 162. The outer end portions of the arms of frame 162 are provided with aligned holes through which project the shaft 80. Shaft 161 is parallel to shaft 80, and a drive chain 163 extends between sprockets on the respective shafts 80 and 161 to rotate shaft 161 upon rotation of shaft 80. It will be understood, however, that the frame 162 is free to pivot about shaft 80 since this does not vary the distance between shafts 80 and 161. Thus the paddles 160, 161' are free to move upwardly and downwardly with respect to the surface of belt 111, the paddles 160, 160' having radially disposed rounded end flexible blades 160*a* which progressively strike the upper surface of the wrappers 10 to urge them against the inner end portion of guide flange 140.

It will be seen in FIG. 11 that an inverted L-shaped brace 164 is mounted on bracket 142*a*, the upper end of which overhangs the web of the U-shaped frame 162. A spring 165 for counterbalancing the weight of the centering member extending between the web of frame 162 and the overhanging portion of brace 164 so that paddles 160, 160' more freely ride up and over each bacon wrapper 10.

Straight Line Sealing Machine

In the modified form of the present invention as illustrated in FIGS. 15 and 16, the base includes upstanding legs or standards 220 between the upper ends of which extend the upper longitudinal runners 221 and 222 and the transverse end bars 223 and 224. The lower runners 225 connect intermediate portions of the legs 220. Supported by the longitudinal runners are the spaced, parallel, transversely extending, inverted, U-shaped brackets 226, 226*a*, 226*b*, 226*c*, 226*d*, 226*e* and 226*f* over which is disposed a rectangular horizontal metal plate or sheet 227.

Beyond the outer brackets 226 and 226*f* are the transversely disposed, parallel rollers 228 and 229 respectively, the central shafts 230 and 231 of which are supported by pillow blocks 232 and 233. The pillow blocks 232 and 233 are mounted on the end portions of runners 221 and 222. A motor 234 carried by runners 225 drives, through a gear reducer 235 having a sprocket 236, an endless chain 237, passing around sprocket 238 on shaft 231.

A main conveyor belt 240 passes around the rollers 228 and 229 with its upper flight passing over and sliding upon the plate 227 and its lower flight passing below the web portions of brackets 226, 226*a*, 226*b*, 226*c*, 226*d*, 226*e* and 226*f*. Thus it is seen that, upon energization of motor 234, the upper flight of belt 240 will be moved continuously from left to right in FIGS. 15 and 16.

A chute 241, similar to chute 70, is mounted on the bracket 226 and secured to the edges of plate 227 so as to feed bacon wrappers onto the infeed end of the conveyor 240.

Heating elements 242 and 243, similar to heating elements 54 and 55, are provided on brackets 226*a* and 226*b*, while heating element 244, which is similar to heating element 144, is mounted on brackets 226*d* and 226*e*. The heating elements 242 and 243 are transversely opposed to each other, being outwardly adjacent the opposite edges of belt 240 whereby, as the belt 240 moves the bacon wrappers through the machine, the opposite edges of the wrappers ride in slots in the heating elements 242 and 243. The heating element 244 is aligned longitudinally with the heating element 242 for purposes to be described hereinafter.

Beyond the heating elements 242 and 243, respectively, are the fluting rollers 245 and 246 which are similar to rollers 51, 51', the rollers 245 and 246 being driven by intermeshing gears in gear boxes 247 and 248. The gear boxes 247 and 248 are supported from runners 221 and 222 respectively by brackets, such as bracket 249. The intermeshing gears of gear box 247 and 248 are driven by a common transverse shaft 250 having sprocket 251 which is driven from shaft 231 through sprocket 252, on one end of shaft 231, and chain 253.

The other end of shaft 231 is provided with a sprocket 254 which drives, by means of chain 255, a sprocket 256 on a shaft of gear box 257. The gear box 257 is mounted on runner 221 and is provided with fluting rollers 258, 259 in alignment with heating element. The function of these fluting rollers 258, 259 is similar to the function of rollers 146, 146' and these rollers may include the date stamping means previously described, if desired.

Over the infeed portion of conveyor belt 240 is an auxiliary infeed conveyor assembly 260 similar to the infeed conveyor assembly 66 shown in FIGS. 13 and 14, the infeed conveyor being carried by shaft 261 and provided with spaced conveyor belts 262 and 263. The shaft 261 is carried by floating bearings 264 and 265 mounted on runners 221 and 222. A chain 266 extending between sprocket 267 on shaft 261 and sprocket 268 of the gear box 247 transfers power for the rotation of shaft 261 and the driving of belts 262 and 263.

According to the present modified embodiment of the invention, in the outfeed or rear portion of the machine is a flat plate 270 extending over a portion of the belt 240, the plate 270 being secured by one side to a spacer bar 271 extending adjacent the edge of sheet 227 and secured to brackets 226*c*, 226*d*, 226*e* and 226*f*. The lower surface of plate 270 extends closely adjacent and parallel to the upper surface of the upper flight of conveyor belt 240 and terminates about midway of the belt 240 in an upwardly extending flange 272. The front end of flange 272 curves outwardly at numeral 273 to provide a camming surface immediately behind the belt 263 for the purpose of providing a turning means for the bacon wrappers by which the wrappers on belt 240, emerging from beneath the auxiliary conveyor 260, are turned 90° in a clockwise direction and are urged toward runner 221.

Over the outfeed portion of the conveyor belt 240 is an outfeed auxiliary conveyor assembly 280 having spaced auxiliary conveyor belts 281 and 282 and drive shaft 283, the auxiliary conveyor assembly 280 being similar to outfeed conveyor assembly 68 shown in FIG. 1. The shaft 283 is carried by floating bearings 284 and 285 on runners 221 and 222 and is driven from gear box 257 by sprockets 286, 287 and chain 288 therebetween.

In front of the heating element 244 is a flange turning member, denoted generally by numeral 290, the turning member being mounted on a platform 291 extending from plate 227. Turning member 290 is similar to turning member 154.

Operation

From the foregoing description the operation of the present invention should be apparent. In the embodiment of FIGS. 1–4, after starting the motor 38, the bacon wrappers 10, each containing a pound of bacon, are fed into the chute 70, the operator being sure that the flap 13 extends generally over the base 11 and that the wrapper 10 is fed to chute 70 with flap 13 up and the common fold line 14 first.

When so fed, each successive wrapper slides down rods 75, passing beneath fingers 79 onto the outer end portion of the upper flight of belt 32 whence the wrapper 10 is moved beneath the auxiliary belts 98, 98' with its edges extending outwardly. Upon further inward movement of wrapper 10, its opposed edges simultaneously slide along the slots of the heating elements 54 and 55. Since the lower flights of belts 98, 98' are moving in synchronization with the inward movement of the upper flight of belt 32, each wrapper 10 is moved inwardly with its opposite edges being progressively heated during the travel to a temperature sufficient to melt or render plastic the adhesive 15 on the inner surfaces of the opposite edges of overlapped flap 13 and base 11. The weight of the auxiliary conveyor assembly tends to flatten the wrapper 10 so that no appreciable misalignment of the flap 13 with respect to the base 11 takes place.

After the wrapper edges 16 and 17 are passed through

the heating elements **54** and **55**, they enter between the fluting rollers **51**, **51'** where pressure is applied as the steel surfaces of the rollers cool the edges **16** and **17** and hence complete the seals of these opposite edges.

Thence, the wrapper **10** emerges from beneath the auxiliary conveyor assembly **66** and soon thereafter is thrust over the guide roller **110** onto the outfeed conveyor belt **111**. The paddles **160**, **160'** engage the upper surface of the wrapper **10** and urge them against the inner end portion of guide flange **140** as the wrapper **10** is progressively moved outwardly by belt **111**.

Upon further movement of the belt **111**, the wrapper passes beneath the auxiliary conveyor assembly **68**. Then flange **19** is folded over the unsealed edge of wrapper **10** as it passes the turning member **154** and the three plies of the wrapper **10** are passed through the slots of heating element **144**. Next, the three plied edge of wrapper **10** passes between rollers **146**, **146'** and receives an impression of the indicia **153** on plates **151**, **151*a*** and **151*b***, the indicia **153** of plates **151**, **151*a***, **151*b*** having been preset for a particular code. Thereafter the wrapper **10** is discharged from the end of the conveyor belt **111** into a suitable receptacle (not shown).

The modified form of the present invention as illustrated in FIGS. 14 and 15 operates in essentially the same manner as above described except that wrapper **10** remains at all times on conveyor belt **240**, being carried from left to right and being turned while still on the belt **240**, 90° when its corner engages the camming surface **273**.

It is therefore seen that in either embodiment, the wrappers **10** are successively conveyed along a predetermined path, being supported in their central portion by the main conveyors **32** and **111** or **240** and that immediately prior to the time the edges of wrappers **10** enter the heating elements **54**, **55**, **144**, **242**, **243** and **244**, the wrappers pass beneath the auxiliary conveyors **66**, **68** or **260** and **280** so as to be held firmly but yieldably in place on the main conveyor with the edges thereof parallel to the path of travel. Between the first heating elements **53**, **54** or **242**, **243** and the second heating elements **144** or **244**, the wrappers **10** are repositioned, relocated or reorientated with respect to the path of travel so that the remaining unsealed edge is arranged parallel to the path of travel of the wrappers **10** and therefore may be heated by the second heating elements **144** or **244**.

It will also be observed, with respect to both embodiments, that first heating elements **53**, **54** and **242**, **243** are spaced apart approximately the width of the wrapper **10** and that the belts **32** and **240** are less wide than the width of wrapper **10** and less wide than the distance between the first heating elements **53**, **54**, **242**, **243** so as to pass therebetween holding the wrapper **10** with its edge portions protruding from both edges of belts **32** and **240**.

It will be obvious to those skilled in the art that many variations may be made in the embodiments chosen for the purpose of illustrating the present invention and that full resort may be had to the use of equivalents of the elements herein depicted and parts may be made integral or separated without departing from the scope of the present invention as defined by the appended claims.

I claim:

1. A sealing machine comprising a supporting frame, a main infeed conveyor mounted on said frame for transporting successive relatively flat containers and discharging the same from one end thereof, a main outfeed conveyor mounted on said frame at said end of said main conveyor for receiving and transporting said relatively flat containers, said main outfeed conveyor being arranged normal to the main infed conveyor, means for successively feeding said relatively flat containers onto said main infeed conveyor, a pair of heating elements carried by said frame adjacent the edges of said main infeed conveyor, the space between said heating elements being approximately the width of said containers, the width of said main infeed conveyor being less than the distance between said heating elements, sealing means carried by said frame and arranged beyond said heating elements in the direction of travel of said main infeed conveyor, said sealing means being aligned with said heating elements, said main infeed conveyor being adapted to transport successive of said containers between said heating elements and then between said sealing means whereby the opposed edge portions of said containers are first heated, then sealed and discharged from said main infeed conveyor, a third heating element carried by said frame adjacent one edge of said main outfeed conveyor for heating the third edge portions of said containers which lie normal to said opposed edge portions of said containers, sealing means on said frame for sealing said third edge portion after the same has been heated, means for urging said containers against said containers against said conveyors, said last mentioned means including a pair of auxiliary conveyors, one auxiliary conveyor being over said main infeed conveyor and the other of said auxiliary conveyors being over said main outfeed conveyor, each of said auxiliary conveyors including a pair of spaced conveyors synchronized with its main conveyor for urging said containers along their paths between an auxiliary conveyor and a main conveyor, each auxiliary conveyor being pivotally mounted by one end to said frame and being adapted to be urged away from its main conveyor by said containers thereon, and means for positioning said containers on said main outfeed conveyor immediately after each container is discharged from said main infeed conveyor onto said main outfeed conveyor, said means for positioning said containers including a paddle with flexible members, said paddle being carried by said frame above said outfeed conveyor.

2. A machine for successively sealing three edges of substantially rectangular, folded paperboard container blanks, having integral front and rear walls with three heat sealable edge portions, to form relatively flat two-walled bacon packages or the like, comprising a supporting frame means; means supplying container blanks with said front and rear walls folded into a face-to-face relation and with said heat sealable edge portions in substantial registry; main conveyor means, having infeed and outfeed portions mounted on said frame means, for transporting successively said folded container blanks along a predetermined path in a predetermined direction; first heating means carried by said frame means adjacent said conveyor infeed portions for heating the registered edge portions of said folded container blanks; first sealing means carried by said frame means and arranged beyond said first heating means in the direction of travel of said infeed conveyor portions and in alignment with said first heating means; turning means beyond said first sealing means in said direction of travel for re-orienting said package substantially 90° with respect to said predetermined path of travel; second heating means arranged beyond said turning means in said predetermined direction of travel and adjacent said outfeed conveyor portions for heating the registered edge portions of said re-oriented container blanks; second sealing means carried by said frame means adjacent said conveyor outfeed portions beyond said second heating means in said direction of travel for sealing said second heated edge portions, one of said first and second heating means including a pair of opposed heating elements and the other of said heating means including at least one heating element, said elements being adapted to heat each of said heat sealable edge portions of said paperboard blanks.

3. A sealing machine according to claim 2, which includes means for urging said folded container blanks against said main conveyor means during the periods said registered edge portions are heated by said heating means.

4. A sealing machine according to claim 3, in which said means for urging said folded blanks against said main conveyor means comprise auxiliary conveyor means,

said auxiliary conveyor means being yieldably positioned over said main conveyor means for acting against the upper surface of said container blanks.

5. A sealing machine according to claim 4, in which said auxiliary conveyor is driven synchronously with said main conveyor means.

6. A sealing machine according to claim 2 for sealing folded blanks having flange portions extending outwardly from one of said wall portions, which includes a turning member adapted to fold said flanges of each of said container blanks back against the registered wall portions of said blanks as said blanks are conveyed past said turning member.

7. A sealing machine according to claim 2, in which said sealing means comprise pairs of opposing knurled rollers.

8. A sealing machine according to claim 2, in which said first sealing means comprises two pairs of opposed knurled rollers, said second sealing means comprises one pair of opposed knurled rollers.

9. A sealing machine according to claim 2, in which

said infeed conveyor portions are arranged normal to said outfeed conveyor portions.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,143,837 August 11, 1964

Chalmers W. Barr

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 65, for "to flap" read -- the flap --; line 72, for "automaticaly" read -- automatically --; column 5, line 34, for "angled" read -- angle --; column 8, line 26, after "small" insert -- portion --; column 9, line 10, for "161'" read -- 160' --; column 10, line 52, for "FIGS. 1-4" read -- FIGS. 1 14 --; column 11, line 13, after "Then" insert -- the --; line 70, for "infed" read -- infeed --; column 12, line 17, strike out "against said containers".

Signed and sealed this 24th day of November 1964.

(SEAL)
Attest:

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