

July 26, 1938.

C. T. WALTER

2,124,722

APPLICATOR

Filed Dec. 13, 1935

4 Sheets-Sheet 1

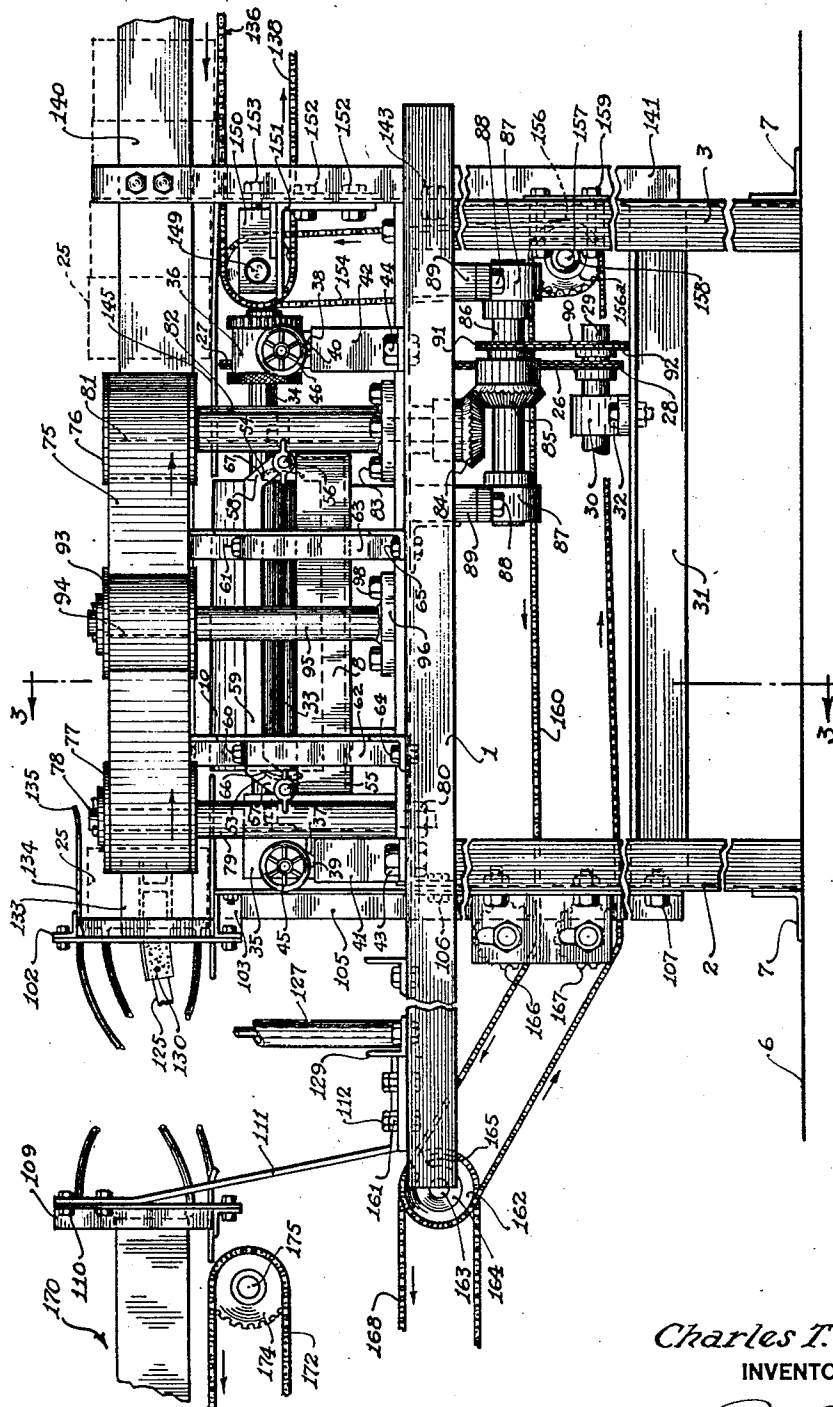


Fig. 1

WITNESS:
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4 Sheets-Sheet 2

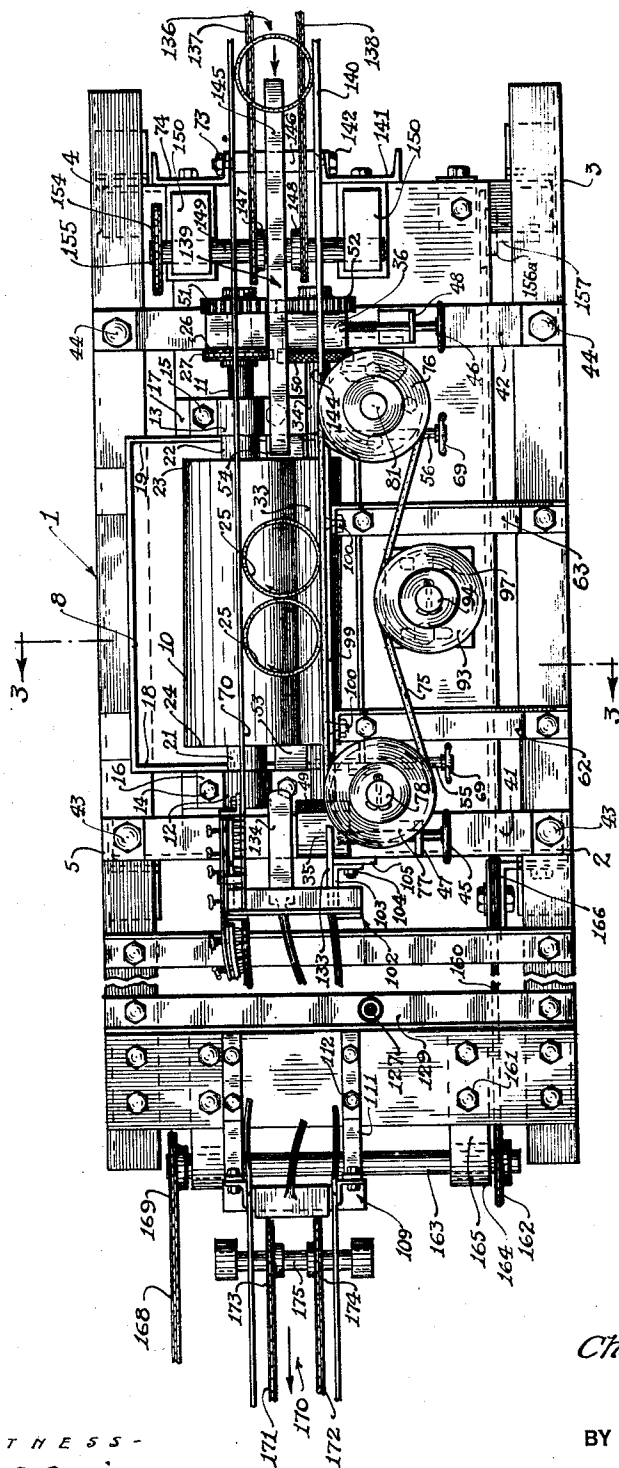


Fig. 2

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4 Sheets-Sheet 3

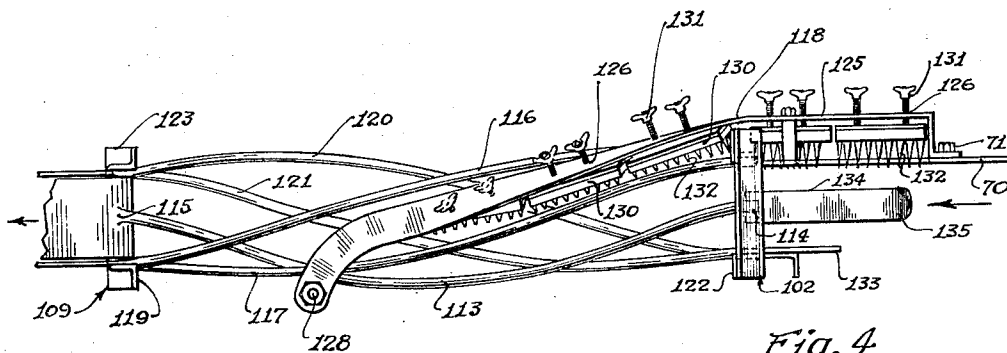


Fig. 4

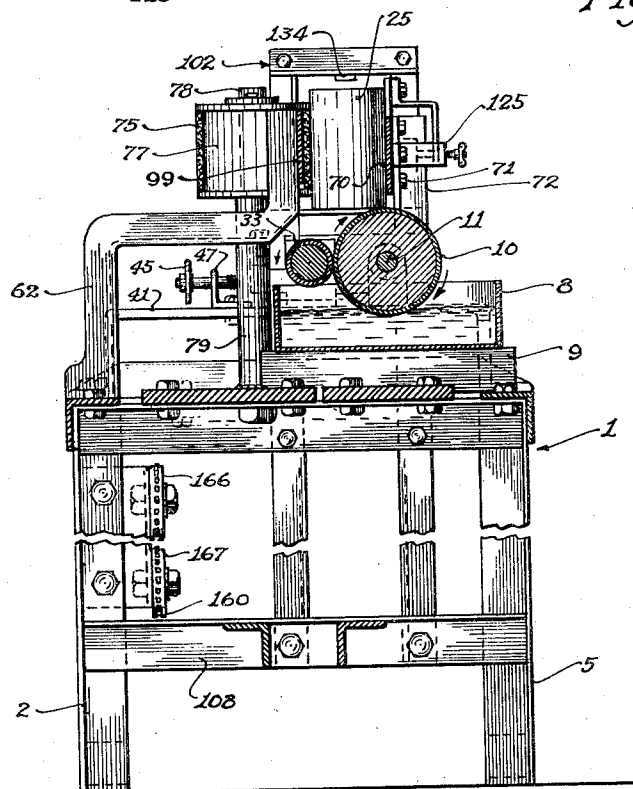


Fig. 3

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4 Sheets-Sheet 4

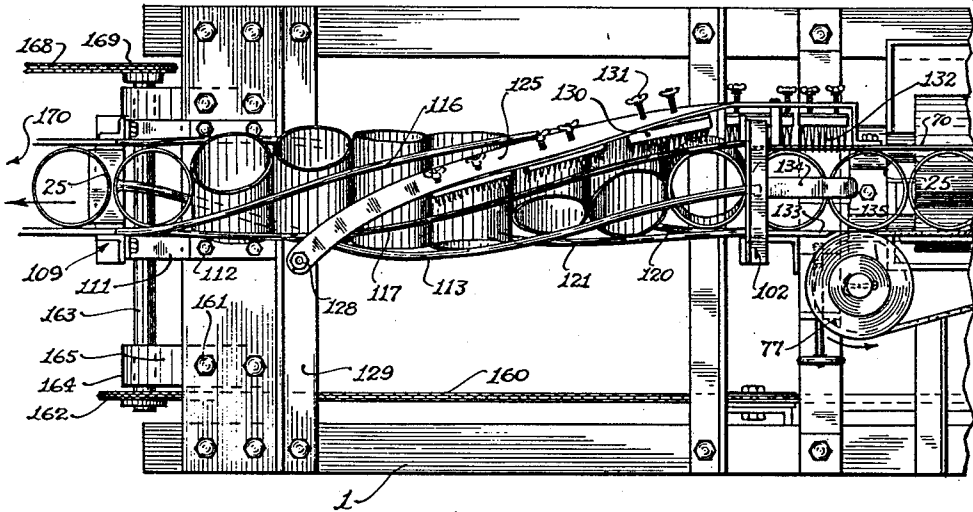


Fig. 5

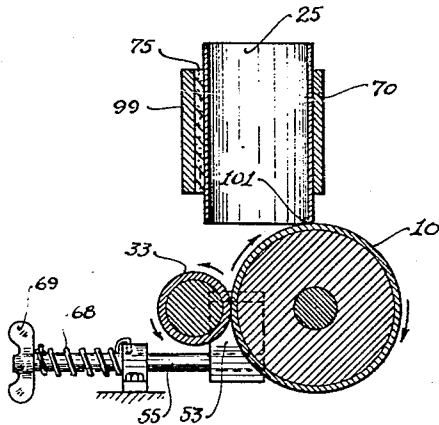


Fig. 6

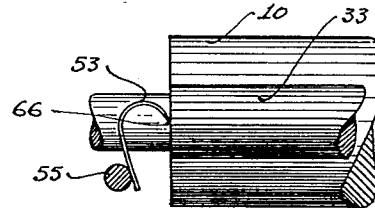


Fig. 7

WITNESS -
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UNITED STATES PATENT OFFICE

2,124,722

APPLICATOR

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Application December 13, 1935, Serial No. 54,181

16 Claims. (Cl. 91—51)

This invention relates to means for applying a congealable material to the ends of tubular bodies.

One of the objects of this invention is to provide means for depositing a bead of congealable material upon the peripheral edges of a tubular body.

Another object of this invention is to provide means for applying a congealable material to the ends of fibrous container bodies by which the body wall will be sealed against capillary attraction of the material placed within the container.

Another object of this invention is to provide a device for sealing the ends of a fibrous container body against capillary attraction of product placed therein and for depositing a bead of congealable compound upon the peripheral edges thereof in one continuous operation.

Other objects will be apparent from the description and claims which follow.

For a full understanding of the several aspects of this invention, reference may be had to the drawings accompanying this specification in which similar reference characters in the several figures indicate similar elements.

Figure 1 is a side view partly broken away illustrating a preferred embodiment of the device.

Figure 2 is a plan view of the device shown in Figure 1.

Figure 3 is a view partly in section taken on line 3—3 of Figure 1.

Figure 4 is a plan view illustrating means for inverting the container bodies as they are discharged from the material applying mechanism.

Figure 5 is a view similar to Figure 4 illustrating the relationship of the inverting mechanism to the material applying mechanism.

Figure 6 is an end view of the material applying mechanism in which is illustrated the scraping means secured at the ends thereof.

Figure 7 is a side view of the scraping means shown in Figure 6.

In the drawings, the numeral 1 represents suitable framework mounted upon standards or uprights 2, 3, 4, and 5. Standards 2, 3, 4, and 5 are bolted or otherwise secured to floor 6 by angle brackets 7.

Tray 8 carries a working supply of a congealable material and is rigidly mounted upon raised platform 9 bolted or otherwise secured to framework 1.

Roller 10 is secured to shaft 11 journaled in bearings 12 and 13. Bearings 12 and 13 are se-

cured by bolts 14 and 15 to flanges 16 and 17 which are secured to framework 1. Thrust movement of roller 10 is prevented by enlarged portions or collars 21 and 22 secured to shaft 11 between roller 10 and bearings 12 and 13, respectively. Roller 10 is partially submerged within the supply of congealable material contained in tray 8 and, when rotated, is continuously supplied with a film of the material. Roller 10 is graduated in diameter substantially one-quarter of an inch to the foot from small end 23 to large end 24, to assure positive contact with the container bodies 25 carried from the small end to the large end. Shaft 11 is rotated by chain 26 trained between sprocket wheels 27 and 28 pinioned to shaft 11 and drive shaft 29, respectively. Shaft 29 is journaled in suitable bearings such as bearing 30 secured to beam 31 by bolts 32 and is driven by suitable gearing connected to a motor or other source of power not shown.

Roller 33 is secured to shaft 34 journaled in bearings 35 and 36. Bearings 35 and 36 are slidably mounted in guideways 37 and 38 provided on brackets 39 and 40 rigidly secured to supports 41 and 42, respectively. Supports 41 and 42 are secured to framework 1 by bolts 43 and 44, respectively. Roller 33 is also graduated in diameter substantially one-quarter of an inch to the foot in a direction counter to roller 10 and is held in adjustable relationship with roller 10 by screw spindles 45 and 46 pivotally secured to bearings 35 and 36.

Screw spindles 45 and 46 are engaged in threaded openings provided in angle brackets 47 and 48 bolted or otherwise secured to supports 41 and 42, respectively. Roller 33 is maintained in end-to-end relation with roller 10 by collars 49 and 50 pinioned to shaft 34 adjacent to bearings 35 and 36, respectively. Shaft 34 is driven by gear wheels 51 and 52 pinioned to shafts 11 and 34, respectively.

Figure 3 of the drawings presents a sectional view taken from the entrance end of container bodies 25, from which end roller 10 is shown as rotating in a clockwise direction while roller 33 is shown rotating in a counter-clockwise direction. Roller 33 serves as a scraping means to roller 10 by which the film of congealable material carried from tray 8 by roller 10 can be adjusted to any desired thickness. Only that thickness of film which can pass between the two rollers remains on the surface of roller 10 after passing the plane of adjustment with roller 33. The counter graduation of roller 33 in relation to roller 10 serves to uniformly regulate the

film of material on roller 10 throughout its entire length. The counter rotation of roller 33 presents an ever-changing scraper surface by which clogging of applying mechanism by reason of congelation of the congealable material is eliminated.

Scraping elements 53 and 54 are flexibly mounted at the ends of rollers 10 and 33. Scrapers 53 and 54 are rigidly secured to smooth spindles 55 and 56 journaled in suitable bearings provided in arms 57 and 58 of cross-piece 59. Crosspiece 59 is secured by bolts 60 and 61 to standards 62 and 63 secured by bolts 64 and 65 to framework 1.

Scrapers 53 and 54 are bent at their free ends in such a manner as to present scraping edges 66 and 67 against the edges of the end faces of rollers 10 and 33. The scraper at each end is positioned as shown in Figures 6 and 7 whereby one scraper cleans the face of both rollers at that end. Scrapers 53 and 54 serve to prevent the congealable material from piling up on the ends of rollers 10 and 33 and are held in flexible engagement with the ends of rollers 10 and 33 by coil springs 68 pinioned to spindles 55 and 56 and their respective bearings. Spindles 55 and 56 are provided with winged handles 69 to provide means for flexing scrapers 53 and 54 away from rollers 10 and 33 to permit removal of congealed material which will tend to accumulate on the under surface of scrapers 53 and 54 from time to time. Material removed from the ends of rollers 10 and 33 by scrapers 53 and 54 is deflected into tray 8.

Elongated plate 70 serves as a vertical wall to guide container bodies conveyed over roller 10. Plate 70 is welded or otherwise rigidly secured to frame 102 and to upright 74 by bolt 73. Guide plate 70 longitudinally traverses roller 10 slightly to one side of the axis of rotation of roller 10, by which a portion of the ends of the container bodies passing over roller 10 will engage roller 10 at a plane substantially vertical to its axis of rotation.

Endless belt 75 is mounted parallel to and a suitable distance from guide plate 70 by which container bodies 25 are held in frictional engagement with plate 70. Belt 75 is mounted upon drive pulley 76 and idler pulley 77. Idler pulley 77 is mounted upon shaft 78 integral with standard 79, secured to framework 1 at its threaded end by nut 80. Drive pulley 76 is pinioned to shaft 81 journaled in tubular upright 82 secured to framework 1 by bolts 83.

Beveled gears 84 is pinioned to the lower end of shaft 81 and is meshed with beveled gear 85 pinioned to shaft 86. Shaft 86 is journaled in bearings 87 secured by bolts 88 to brackets 89 rigidly secured to framework 1. Shaft 86 is driven by chain 90 trained between sprocket wheels 91 and 92 pinioned to shafts 86 and 29, respectively.

Idler pulley 93 is mounted upon shaft 94 integral with standard 95. Base 96 of standard 95 is provided with slots 97 to provide adjustment of pulley 93 in relation to belt 75. Standard 95 is held in fixed position on framework 1 by bolts 98. Pulley 93 provides means for holding belt 75 taut around pulleys 76 and 77.

Plate 99 is rigidly secured by bolts 100 to standards 62 and 63. Plate 99 is mounted immediately in back of the working area of belt 75 and serves to prevent belt 75 from being deflected from a straight line position, thus assuring positive rotation of the container bodies dur-

ing movement of the container bodies between the ends of roller 10.

As shown in Figure 6 of the drawings, a portion of the lower ends of container bodies 25 is in substantially tangential engagement with roller 10. Due to the rotation of roller 10, that portion of the ends of the container bodies in engagement with roller 10 will be coated with a film of congealable material by which to seal the container wall against capillary attraction of the product placed therein and simultaneously a bead of congealable material will be deposited against the inner peripheral edge of the container body as indicated by the numeral 101 in Figure 6. As the container bodies are rotatably conveyed over roller 10, the entire periphery of the container end will be brought into engagement therewith.

It will be seen that by reversing the direction of rotation of roller 10 the congealable material will be deposited on the outer rather than the inner peripheral edge.

By the employment of two such rollers rotating in opposite directions over which the container bodies may pass in succession, a bead of material may be applied which will cover the end edges and lap over on the inner and outer peripheral edges.

Rectangular frame 102 is rigidly secured a suitable distance from the discharge end of the applying mechanism by brackets 103 and bolts 104 to uprights 105 secured by bolts 106 and 107 to framework 1 and cross-beam 108, respectively. Frame 102 encompasses the path of travel of container bodies 25 and provides a suitable anchorage for a guide means and one end of an inverting means through which the container bodies are passed after their discharge from the applying mechanism.

Rectangular frame 109, of similar shape and size to frame 102, is rigidly secured by bolts 110 to uprights 111 secured by bolts 112 to framework 1. Rectangular frame 109 provides a suitable anchorage means for the opposite end of the inverting mechanism.

The inverting mechanism comprises a plurality of helically wound guide rods rigidly welded or otherwise secured between frames 102 and 109.

As shown in Figures 4 and 5 of the drawings, rod 113 is secured at one end to the top of frame 102 at 114 and is helically wound to the opposite end secured to the bottom of frame 109 at 115. Rods 116 and 117 extend from side 118 of frame 102 to side 119 of frame 109. Rods 120 and 121 extend from side 122 of frame 102 to side 123 of frame 109. Rods 116, 117, 120, and 121 are helically wound similar to rod 113 and each extends in parallel relationship to rod 113.

Rod 113 at frame 102 engages the top edge of the container body discharged from the applying mechanism and follows such edge during the twisting of the container body, which edge at the discharge end of the inverting mechanism will be on the bottom. Rods 116 and 117 are in opposed relationship with rods 120 and 121 and serve as guide means at the sides of the container bodies during the twisting operation. The inverting mechanism reverses the ends of the container bodies by which they are rested on their uncoated end.

The coated ends of the container bodies, after being discharged from the applying mechanism, are held out of contact with the device to prevent scraping and rubbing with elements of the device. This is accomplished by means of frictional engagement directed against the side wall of the container bodies.

The frictional engagement means comprises a metal strap 125 having a plurality of threaded openings 126, which strap horizontally extends from plate 70 to side 118 of frame 102 and from frame 102 follows for a suitable distance, the path defined between rods 116 and 117. Strap 125 is secured at one end to plate 70 by bolt 71 and to frame 102 by welding or in any other suitable manner. Strap 125 at its opposite end is rigidly secured to standard 127 by nut 128. Standard 127 is rigidly secured to beam 129 of framework 1. A plurality of brushes 130 are adjustably secured on strap 125 by means of spindles 131 in engagement with threaded openings 126. Brushes 130 are provided with bristles 132 adapted to impinge against the side walls of container bodies 25. Bristles 132 are of a rather stiff, coarse type and are suitably adjusted to firmly support the container bodies with the least resistance to their forward movement.

Plate 133 is rigidly secured to side 122 of frame 102 and serves to hold the container bodies in engagement with bristles 132 during their travel between the applying mechanism and the inverting mechanism.

Guard member 134 having a flared end 135 is welded or otherwise secured to the top of frame 102 and serves as a guide means for directing the uncoated ends of the container bodies into the inverting mechanism.

Container bodies 25 are impelled through the inverting mechanism by force of succeeding container bodies conveyed through the applying mechanism.

Container bodies 25 are introduced to the applying device by endless conveyor 136, comprising endless chains 137 and 138 extending from a loading point not shown. As the container bodies are discharged from conveyor 136, they are impelled by the force of succeeding bodies through channel 139 to the applying mechanism. Channel 139 is defined on the one side by guide plate 70 and on the opposite side by guide plate 140 rigidly secured to upright 141 by bolts 142, secured to framework 1 by bolts 143. Plate 140 extends from a source not shown to end 144 adjacent pulley wheel 76 and serves to direct the container bodies to the working area of belt 75.

Channel 139 is provided at its bottom with guide member 145 welded or otherwise secured to cross-member 146 extending between uprights 74 and 141. Guide member 145 is terminated in close proximity to roller 10 and serves to elevate the container bodies traveling thereover to the uppermost plane of roller 10.

Endless chains 137 and 138 of conveyor 136 are driven by sprocket wheels 147 and 148 pinioned to shaft 149 journaled in bearings 150. Bearings 150 are slidably mounted upon brackets 151 secured to uprights 74 and 141 by bolts 152. Bearings 150 are adjusted to a fixed position on brackets 151 by means of bolts 153 pivotally secured in uprights 74 and 141.

Shaft 149 is driven by chain 154 trained between sprocket wheels 155 and 156 pinioned to shafts 149 and 157, respectively. Shaft 157 is journaled in bearings 158 secured to uprights 74 and 141 by bolts 159. Shaft 157 is driven by chain 160 trained between sprocket wheels 156a and 162 pinioned to shafts 157 and 163, respectively. Shaft 163 is journaled in bearings 164 integral with brackets 165 secured to framework 1 by bolts 161. Chain 160 in its travel between sprocket wheels 156a and 162 is guided over idler sprockets 166 and 167 to prevent interference of

the chain 160 with other parts of the device. Shaft 163 is driven by chain 168 mounted upon sprocket wheel 169 and connected by suitable gearing to a motor not shown.

As the container bodies 25 are discharged from the inverting mechanism, they pass on to conveyor 170 by which they are carried to a crimping mechanism. Conveyor 170 consists of endless chains 171 and 172 mounted on sprocket wheels 173 and 174 pinioned to shaft 175 journaled in suitable bearings not shown. Conveyor 170 is preferably connected by suitable gearing to the same source of power as conveyor 136 and operates in synchronism with conveyor 136.

Conveyors 136 and 170 are also synchronized with belt 75 by which container bodies 25 will travel from the loading point, through the applying mechanism, the inverting mechanism, and on to the crimping operation, in an uninterrupted manner.

In the operation of the device, container bodies are successively loaded upon conveyor 136 with one of their ends resting on conveyor elements 137 and 138. As the container bodies are discharged from conveyor 136, they are slidably urged forward on guide member 145 between plates 70 and 140 to the uppermost plane of coating roller 10.

The container bodies are rotatably conveyed between the ends of roller 10 by endless belt 75 in operative relationship with plate 70. Due to the manner in which plate 70 is mounted with respect to roller 10, the container bodies rotatably traverse the longitudinal surface of roller 10, with an ever-changing portion of the lower ends thereof in substantially tangential engagement with the outer surface of roller 10 and with the portion of the inner peripheral edge corresponding to the end portion in engagement with roller 10, in opposed relationship to the rotation of roller 10.

A continuous film of congealable material is carried by roller 10 from a supply contained in tray 8 by which the lower ends of the container bodies, as they are rotated in engagement with roller 10, are coated with the material and simultaneously an endless bead of the material is deposited upon the inner peripheral edges of the container bodies adjacent the coated ends. The film of compound on roller 10 is regulated to a predetermined thickness by adjustment of roller 33 to or from roller 10.

As the container bodies are discharged from the applying mechanism, the coated edges are held out of contact with elements of the device by means of plate 133 and bristles 132 of brushes 130. The container bodies are urged forward between plate 133 and bristles 132 by force of succeeding container bodies discharged from the applying mechanism and thence through the inverting mechanism. The inverting mechanism serves to reverse the ends of the container bodies. Hence the container bodies are rested upon the uncoated ends. The container bodies, after their discharge from the inverting mechanism, pass on to conveyor 170, by which they are carried to a crimping mechanism.

Except where used in a more specific sense, the term "end" as used in the specification and claims is used in the broad sense of including the end edge and the inner and outer peripheral edges.

I claim:

1. A device of the class described comprising a roller having a gradually increasing diameter, means for applying a film of congealable material to the outer surface of said roller and means

for conveying the ends of tubular bodies between the ends of said roller and in a plane parallel to the axis of said roller, said tubular bodies being conveyed in the direction of increasing diameter of said roller.

2. A device of the class described comprising a roller having a gradually increasing diameter, means for applying a film of congealable material to the outer surface of said roller and means for rotatably conveying the ends of tubular bodies between the ends of said roller and in a plane parallel to the axis of said roller, said tubular bodies being conveyed in the direction of increasing diameter of said roller.

3. A device of the class described comprising a roller, means for applying a film of congealable material to the outer surface of said roller and means for rotatably conveying the ends of tubular bodies in contact with and parallel to the axis of said roller, said roller being graduated in diameter in the direction of movement of said bodies by which a portion of each of said ends is maintained in engagement with said roller.

4. A device of the class described comprising a material applying roller, means for applying a film of congealable material to the outer surface of said roller, a scraping roller mounted in relation to said material applying roller to regulate the thickness of the film thereon and spring tensioned scraper means pivotally mounted at the ends of said rollers at their plane of adjustment.

5. A device of the class described comprising a material applying roller having a graduating diameter, means for applying a film of congealable material to the outer surface of said roller and a scraper roller having a graduating diameter counter to said material applying roller and mounted in adjustable relation to said material applying roller for uniformly regulating the thickness of the film applied to said material applying roller.

6. A device of the class described comprising a roller having a graduating diameter, means for applying a film of congealable material to the outer surface of said roller, guide means substantially intersecting the longitudinal surface of said roller and means in operative relation with said guide means for rotatably conveying the ends of tubular bodies substantially parallel to the axis of said roller and in the direction of said graduating diameter, said graduating diameter providing means for maintaining said roller in engagement with the ends of said bodies.

7. In a device of the class described including a material applying mechanism comprising means for rotatably conveying tubular bodies and means for applying congealable material to the ends of said bodies, inverting means at the discharge end of said applying mechanism comprising a plurality of helically wound guide rods for reversing the ends of the container bodies discharged from said applying mechanism and means for frictionally maintaining the tubular bodies between said helically wound guide rods.

8. In a device of the class described including a material applying mechanism comprising means for rotatably conveying tubular bodies and means for applying a congealable material to the ends of said bodies, inverting means at the discharge end of the applying mechanism comprising a plurality of helically wound guide rods positioned to engage the sides of the tubular bodies to reverse the ends thereof and means for frictionally maintaining the tubular bodies between said helically wound guide rods.

9. In a device of the class described including a material applying mechanism comprising means for rotatably conveying tubular bodies and means for applying a congealable material to one of the ends of said bodies, inverting means at the discharge end of said applying mechanism, said inverting means comprising a plurality of helically wound guide rods positioned to engage the uncoated ends and the sides of the tubular bodies to reverse the ends thereof and means for frictionally maintaining the tubular bodies relative to said helically wound guide rods.

10. In a device of the class described including a material applying mechanism comprising means for rotatably conveying tubular bodies and means for applying a congealable material to one of the ends of said bodies, inverting means at the discharge end of said applying mechanism, said inverting means comprising a plurality of helically wound guide rods positioned to guide said container bodies and reverse the ends thereof, said guide rods being positioned to engage the uncoated ends and the opposite sides of said container bodies, and means for frictionally engaging the side walls of the container bodies, said frictional means extending within the path defined by the guide rods positioned at the sides of the container bodies.

11. In a device of the class described including a material applying mechanism comprising means for rotatably conveying tubular bodies and means for applying a material to one of the ends of said bodies, inverting means at the discharge end of said applying mechanism, said inverting means comprising a plurality of helically wound guide rods positioned to guide said container bodies and reverse the ends thereof, said guide rods being positioned to engage the uncoated ends and the opposite sides of said container bodies, and flexible means adapted to impinge against the side walls of said bodies to hold the container bodies within the inverting means, said flexible means extending within the path defined by said guide rods positioned at one of the sides of said bodies.

12. In a device of the class described, a material applying mechanism comprising a roller having a gradually increasing diameter and providing an inclined surface, means for applying a congealable material to the outer surface of said roller, means for regulating the thickness of the material on said roller, means above said roller for rotatably conveying the ends of tubular bodies in contact with and parallel to the axis of said roller and in the direction of inclination of the surface of said roller, means for successively supplying tubular bodies to said conveying means and inverting means at the discharge end of said mechanism to reverse the ends of said container bodies, said tubular bodies being impelled through said inverting mechanism by force of succeeding bodies discharged from said applying mechanism.

13. In a device of the class described including a roller and means for applying a film of congealable material to the outer surface of said roller, means mounted above said roller and comprising a guide means traversing the longitudinal surface of said roller surface, and a conveying means in operative relation with said guide means for rotatably conveying a tubular body relative to said roller, successive portions of one of the ends of the tubular body being moved in contact with the surface of said roller, the wall portions of the tubular body corre-

sponding to the portions of the end in contact with the surface of said roller being maintained substantially in the vertical plane of the axis of said roller.

- 5 14. In an applying device including a rotatable applying roller and means for applying coating material to the surface of the roller, a conveying means mounted longitudinally and above the top surface of the roller, the conveying means being adapted to carry a tubular body
- 10 with a portion of one of its ends in contact with the surface of the roller, the portion of the end of the tubular body and the portion of the side wall of the tubular body corresponding to the
- 15 portion of the end each being maintained in the vertical plane passing through the axis of the roller.

- 15 15. An applying device comprising a horizontally disposed conveying means for conveying material in a substantially horizontal path, an
- 20 applying roller mounted longitudinally rela-

tive to and beneath the path of movement of the material carried on the conveying means and with its crest substantially tangent to the path of movement of the material carried on the conveying means, the roller presenting an angularly upwardly inclined surface relative to the path of movement of the material carried on the conveying means and means for applying coating material to the surface of the roller. 5

16. An applying device comprising means for 10 rotatably conveying a tubular body in a forwardly direction with one of the ends of the tubular body being moved in a substantially horizontal plane, an applying roller mounted longitudinally relative to the path of movement of 15 the end of the tubular body, the roller presenting an angularly upwardly inclined surface relative to the path of movement of the end of the tubular body, and means for applying coating material to the surface of the roller. 20

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