

May 12, 1959

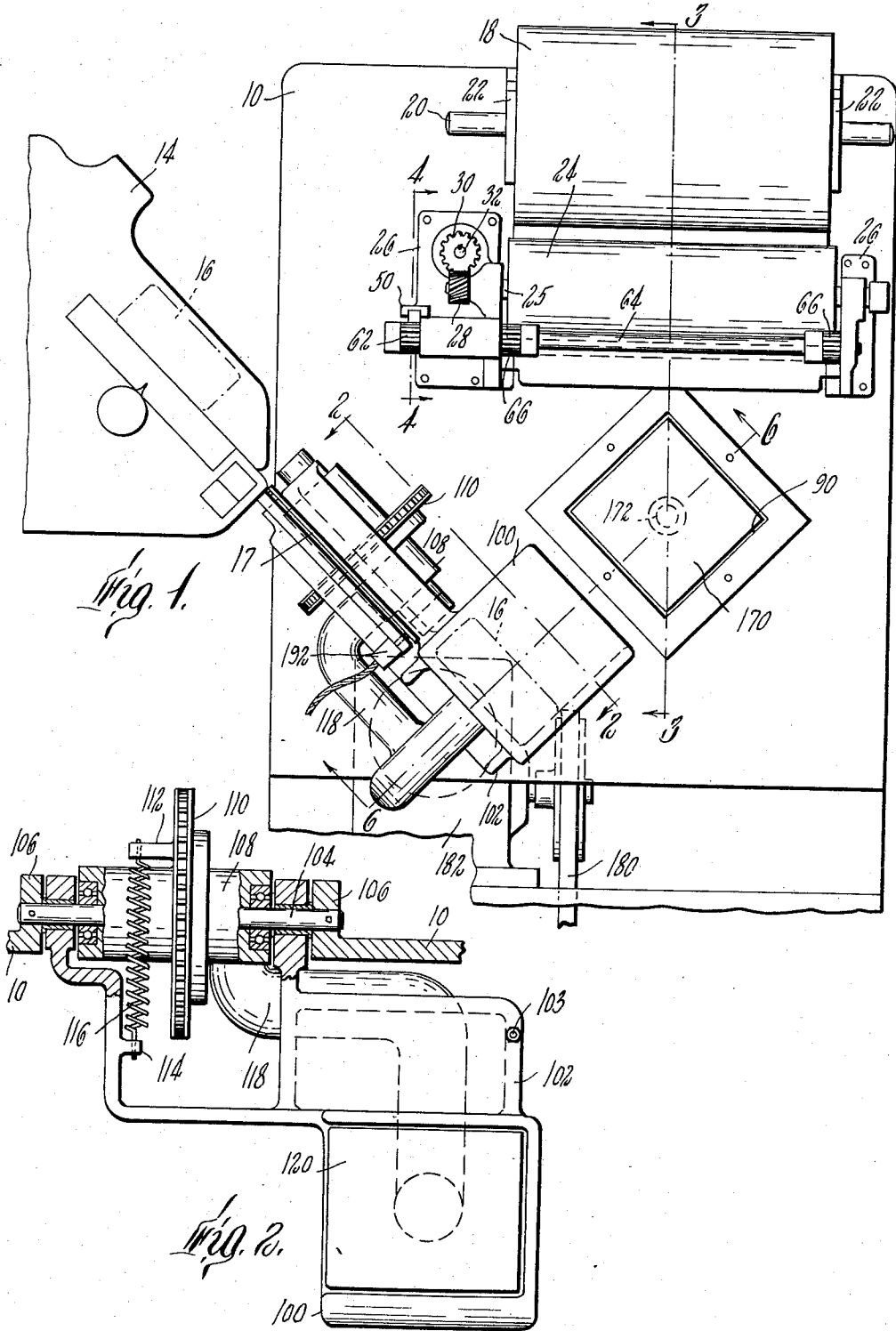
D. G. WAY

2,885,843

APPARATUS FOR WRAPPING ARTICLES

Filed Oct. 26, 1956

6 Sheets-Sheet 1.



May 12, 1959

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2,885,843

APPARATUS FOR WRAPPING ARTICLES

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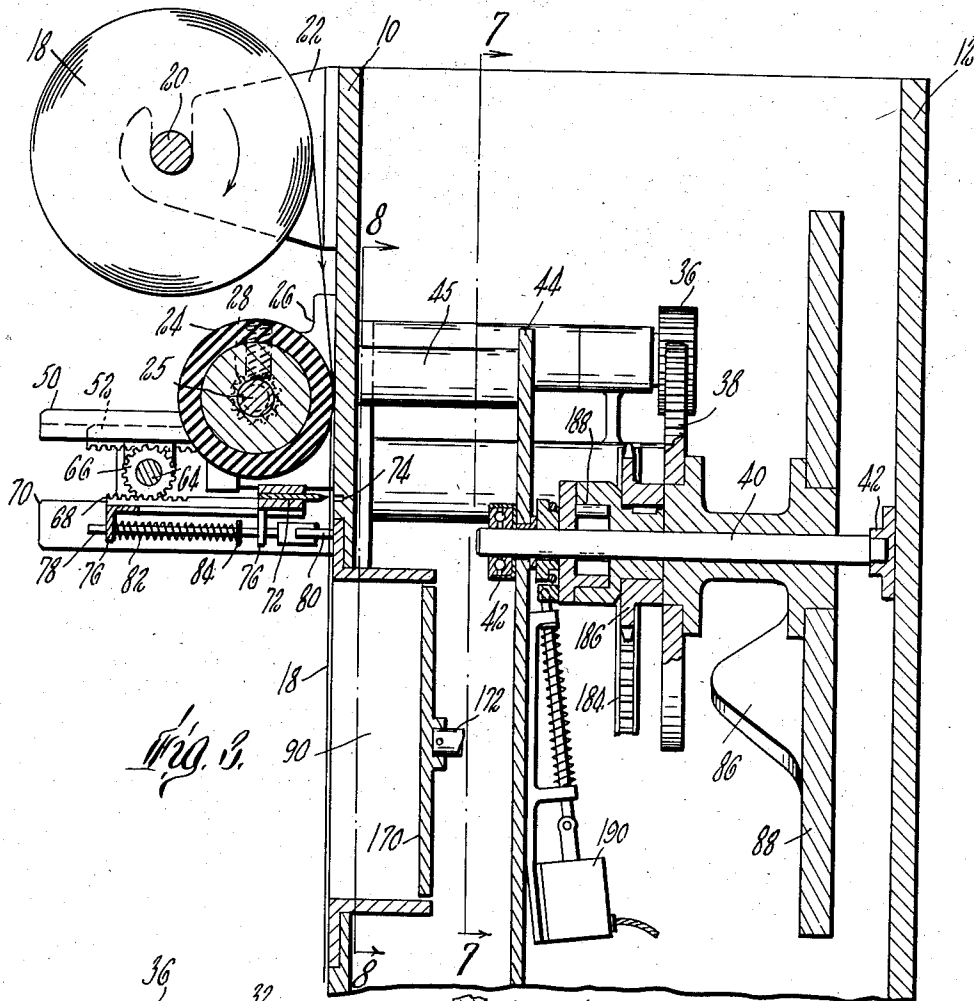


Fig. 3.

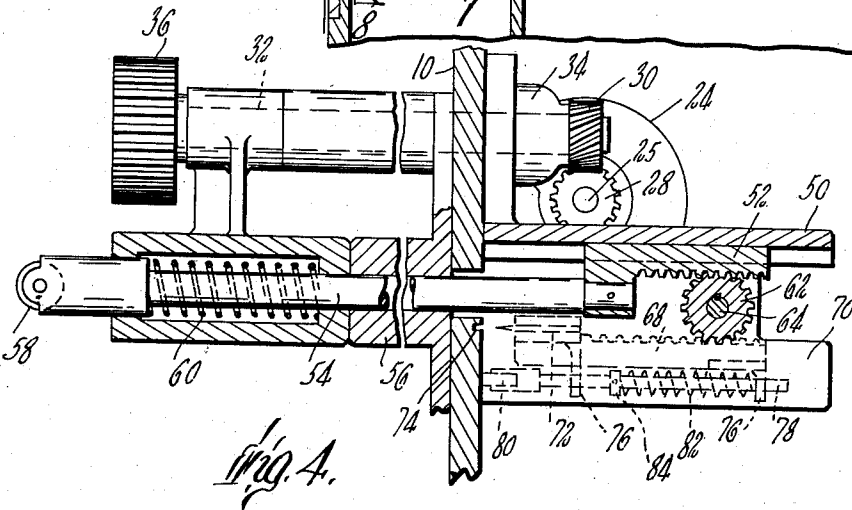


Fig. 4.

May 12, 1959

D. G. WAY

2,885,843

APPARATUS FOR WRAPPING ARTICLES

Filed Oct. 26, 1956

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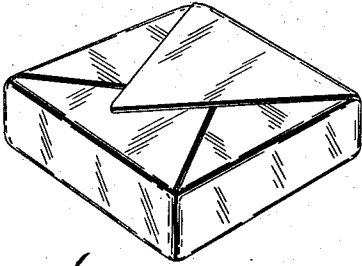


Fig. 5.

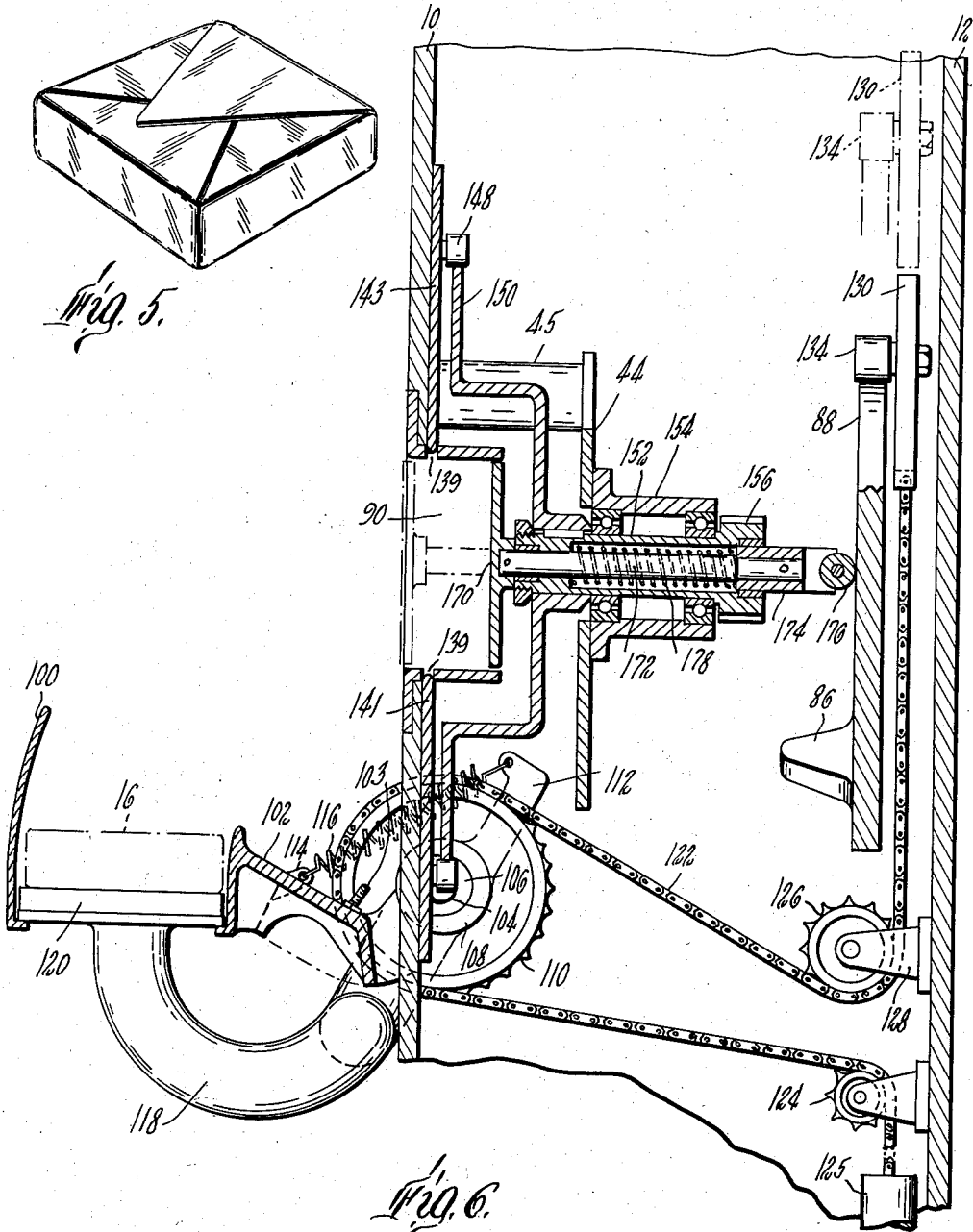


Fig. 6.

May 12, 1959

D. G. WAY

2,885,843

APPARATUS FOR WRAPPING ARTICLES

Filed Oct. 26, 1956

6 Sheets-Sheet 4

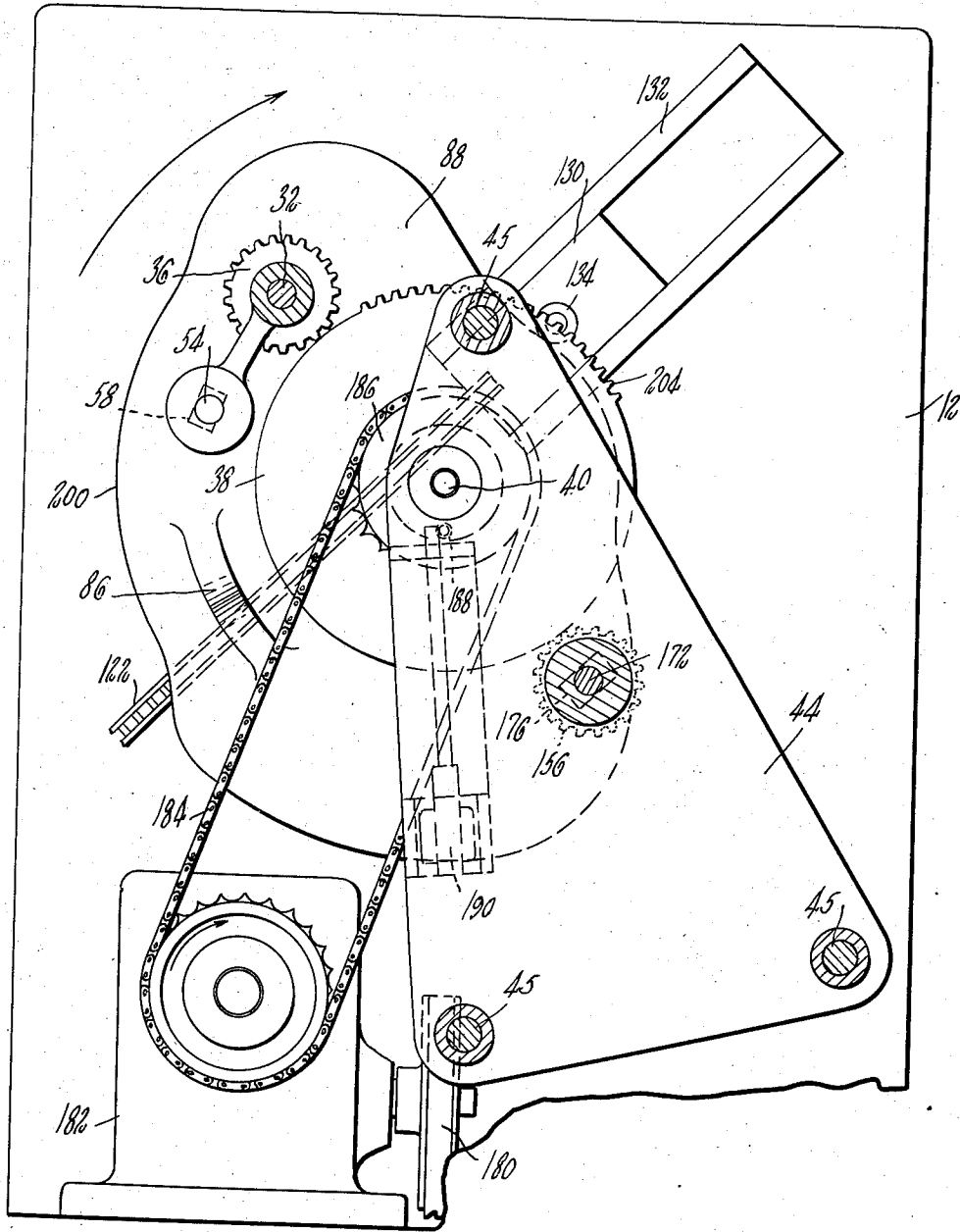


Fig. 7

May 12, 1959

D. G. WAY

2,885,843

APPARATUS FOR WRAPPING ARTICLES

Filed Oct. 26, 1956

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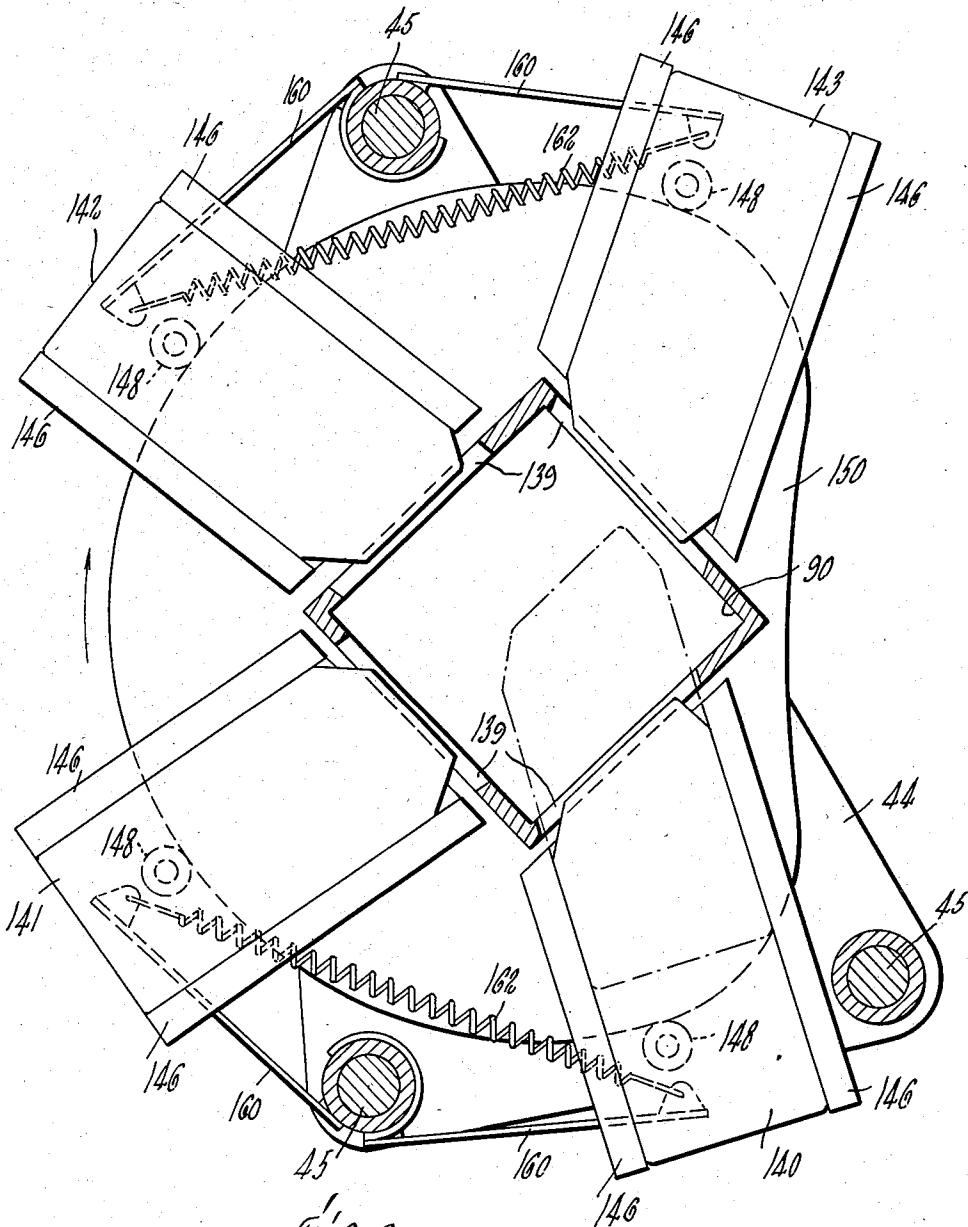


Fig. 8.

May 12, 1959

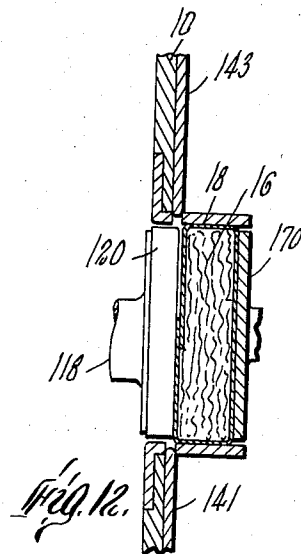
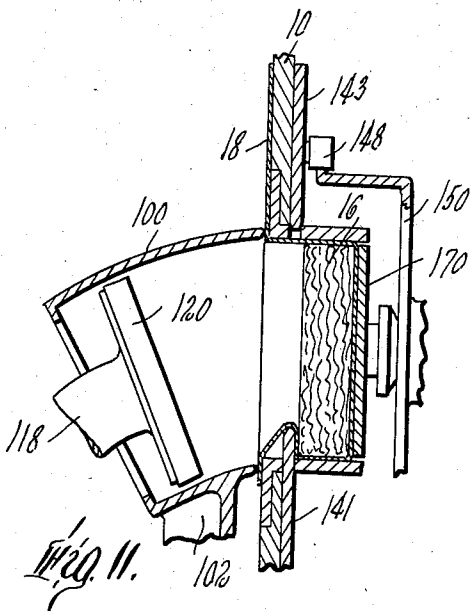
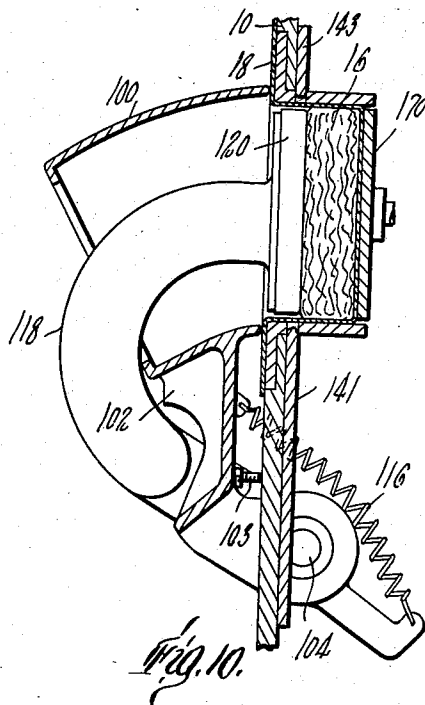
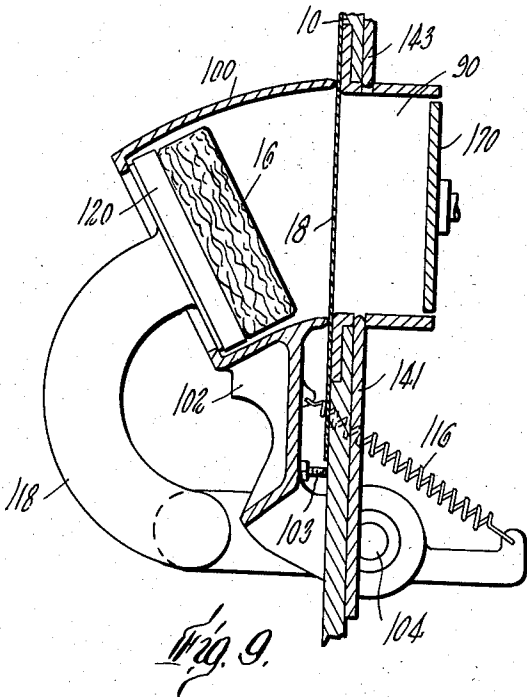
D. G. WAY

2,885,843

APPARATUS FOR WRAPPING ARTICLES

Filed Oct. 26, 1956

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2,885,843

APPARATUS FOR WRAPPING ARTICLES

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Application October 26, 1956, Serial No. 618,563

12 Claims. (Cl. 53—52)

This invention relates to a machine for wrapping or packaging articles and pertains more specifically to a machine for receiving blocks or patties of hamburger from a conventional hamburger-molding or patty-forming machine and automatically wrapping and sealing them to provide a sealed wrapped package.

One object is to provide a machine for wrapping and sealing hamburger blocks or patties at a high rate of speed adapted for use in conjunction with any conventional automatic hamburger block- or patty-forming machine.

Another object is to provide a wrapping machine adapted to utilize wrapping material supplied in the form of a continuous length or roll of sheet material.

Still another object is to provide an article-wrapping machine in which a web of wrapping material is releasably held across the open face of a cavity or chamber while the article to be wrapped is advanced into the cavity through the open face, carrying with it the midportion of the web and leaving the marginal portions outstanding through the open face in position to be infolded about the article.

A further object is to provide a machine of the type described adapted to utilize heat-sealable wrapping material and including means for heat-sealing the wrapping material about the article.

Still another object is to provide a machine of the type described in which a single element performs the dual function of advancing the article into a chamber or cavity while carrying a heat-sealable wrapping material with it and of subsequently heat-sealing the infolded portions of the wrapping material to provide a sealed package.

Still a further object is to provide a machine completely automatic in operation, each cycle of the machine being actuated by the introduction into the machine of the article to be wrapped.

Other and further objects will be apparent from the drawings and from the description which follows.

In the drawings:

Fig. 1 is a view in front elevation, partly broken away, showing one embodiment of the invention;

Fig. 2 is a view along line 2—2 of Fig. 1;

Fig. 3 is a view along line 3—3 of Fig. 1;

Fig. 4 is a view along line 4—4 of Fig. 1;

Fig. 5 is an isometric view of the wrapped article or package delivered by the machine of the present invention;

Fig. 6 is a view along line 6—6 of Fig. 1;

Fig. 7 is a view along line 7—7 of Fig. 3;

Fig. 8 is a view along line 8—8 of Fig. 3; and

Figs. 9 to 12 inclusive are views similar to Fig. 6 showing several stages in the operation of the device.

The device of the present invention, as best shown in Figs. 1 and 3, comprises a framework including front and rear panels 10, 12 serving as a support for the remainder of the device. The machine is preferably mounted immediately adjacent any conventional hamburger block

2

or cake molding machine 14, as seen in Fig. 1, from which the hamburger block or cake 16 to be wrapped slides by gravity over inclined slide 17 directly into the machine of the present invention. Of course, articles may be fed to the machine manually if desired. On front panel 10 of the machine is mounted a supply roll 18 of sheet wrapping material, roll 18 being rotatably mounted by means of shaft 20 on a pair of supporting brackets 22, 22 which are secured to the face of panel 10. The wrapping material may be any suitable flexible wrapping material such as paper, plastic sheet material, metal foil, cellophane or the like and preferably is heat-sealable. In the case of films of thermoplastic resinous materials the film is inherently heat-sealable because of its nature. In the case of other sheet materials a suitable coating may be applied to one or both faces of the wrapping material to render the material heat-sealable, as is well known in the art.

Beneath supply roll 18 is mounted a feed roll 24 which preferably has an outer face of elastic rubber-like material, roll 24 being supported by means of shaft 25 journaled in brackets 26, 26 secured to the face of panel 10. Secured to shaft 25 adjacent one end thereof is a gear 28 which intermeshes with gear 30 keyed to jack shaft 32 journaled in bearing 34 (Fig. 4) mounted on the face of panel 10. Secured at the inner end of shaft 32 is a gear 36 intermeshing with an interrupted gear 38 secured to main drive shaft 40 which is journaled in bearings 42, 42 mounted on rear panel 12 and on an intermediate support member 44 supported from front panel 10 by means of posts 45, 45, 45 (Fig. 7) provided with gear teeth along only one-fourth of its periphery, so that pinion 36 is driven during one quarter only of each revolution of main drive shaft 40, thus serving to rotate feed roll 24 clockwise as seen in Fig. 3 or counter-clockwise as seen in Fig. 4 in order to advance the sheet of wrapping material 18 downwardly by frictional engagement of the sheet between roll 24 and front panel 10.

Mounted below feed roll 24 on the left-hand bracket 26, as seen in Fig. 1, is track 50 on which is slidably mounted rack 52 actuated by push rod 54 which extends through a guide member 56 secured to front panel 10 (Fig. 4). On the inner end of push rod 54 is mounted a cam follower roll 58. A compression spring 60 disposed about push rod 54 between a collar thereon and a shoulder of guide member 56 serves to urge rack 52 toward the left as seen in Fig. 4. Rack 52 engages with pinion 62 keyed to shaft 64, which in turn is journaled in brackets 26, 26. Two additional pinions 66, 66 are likewise keyed to shaft 64 (Fig. 1) and intermesh with racks 68, 68 mounted for sliding movement on guide members 70, 70. Racks 68, 68 carry mounted on their ends adjacent panel 10 a knife 72 which is arranged to enter an aligned slot 74 in front panel 10 to cut sheet wrapping material 18. Racks 68, 68 also carry flanges 76, 76 which slidably support rods 78, 78 to which is secured a resilient gripping member 80. Compression springs 82, 82 are disposed about rods 78, 78 between the rearmost bracket 76 and a collar 84, 84 secured to the rod, so that as racks 68, 68 advance cutting knife 72 gripping member 80 is simultaneously yieldingly urged against sheet wrapping material 18 to hold the same in place as it is being cut.

Cam follower roll 58 mounted on the inner end of push rod 54 is disposed in position to engage shoulder cam 86 (Figs. 6 and 7) mounted on cam plate 88 which is mounted for rotation with interrupted gear 38 on main drive shaft 40.

Disposed beneath reciprocating knife 72 is an open-faced cavity or chamber 90 which has an aperture or portal opening through front panel 10 and which is of the proper size and configuration to receive and conform to

the shape of the article, such as a hamburger block, to be wrapped. In the embodiment shown the aperture and chamber are square, but obviously other shapes, circular or polygonal, may also be employed. It is desirable that the frame of the aperture conform rather closely to the size and shape of the article to be wrapped.

A transfer mechanism for transferring the article such as a hamburger block into wrapping position is provided, being shown best in Figs. 1, 2 and 6 of the drawings. The transfer mechanism comprises a frame 100 open at its top as seen in Fig. 6 and also open at its left-hand side as seen in Figs. 1 and 2 in order to receive the hamburger block 16 as it slides from molding machine 14. Frame 100 is mounted on brackets 102, 102 which are journaled on shaft 104 secured to flanges 106, 106 of panel member 10. An adjustable stop 103 is mounted on one bracket 102 in position to engage panel 10 as brackets 102, 102 pivot. Also journaled on shaft 104 between brackets 102, 102 is a hub 108 carrying a sprocket 110 and an arm 112 fixed to the sprocket and hub. Between arm 112 and a lug 114 fixed to left-hand bracket 102 (Figs. 2 and 6) is a tension spring 116. Also secured to hub 108 is an angular supporting arm 118 carrying at its end a platen 120 which fits within frame 100 and serves as its bottom when frame 100 is in position to receive the article to be wrapped, as shown in Figs. 1 and 6. Platen 120 is provided with any suitable heating means, as for example an electric resistance heater (not shown) so that this platen may serve to heat-seal the wrapping material as will be hereinafter described.

Sprocket 110 is adapted to be rotated clockwise through a portion of a revolution by means of chain 122 which passes about idler sprocket 126 mounted on bracket 128 carried by rear panel 12 and has its end secured to a reciprocating slide member 130 mounted for sliding movement in a guide or track 132 (Fig. 7) secured to rear panel 12. Slide member 130 carries a cam follower roll 134 which rides on the margin of cam 88 as it rotates on main drive shaft 40. The other end of chain 122 passes from sprocket 110 about idler sprocket 124 to counterweight 125 which serves to urge cam follower 134 against cam 88.

It will be apparent from the foregoing description that as cam 88 rotates from the position shown in Fig. 7, follower 134 together with slide member 130 reciprocates along guide member 132, rotating sprocket 110 in a clockwise direction as seen in Fig. 6, thus urging platen 120 into the open face of cavity 90. Inasmuch as frame 100 is yieldingly connected to sprocket 110 by means of spring 116, frame 100 is likewise urged toward cavity 90 along with platen 120. However, when the stop 103 strikes the face of front panel 10 frame 100 stops just short of contact with panel 10 while platen 120 continues its movement into cavity 90, as will be apparent from Figs. 9 and 10, thus leaving clearance space for the movement of the sheet wrapping material between panel 10 and frame 100.

Disposed at the rear face of front panel 10 and mounted for reciprocation across the open face of cavity 90 through apertures 139, 139 are four finger members 140, 141, 142, 143 (Figs. 6 and 8), each finger member being slidably supported in guides 146, 146 secured to panel 10, and each carrying a cam follower roll 148 which bears on the margin of kidney-shaped cam 150. Cam 150 has a cupped central zone to accommodate cavity 90, as seen in Fig. 6, and is keyed to sleeve or hollow shaft 152 journaled in bearing 154 secured to intermediate support member 44. It will be noted that cam follower rolls 148 are arranged in circular array about shaft 152 with the angular spacing between one adjacent pair of followers (the right-hand pair as seen in Fig. 8) being twice the angular spacing between each of the remaining adjacent pairs. This arrangement provides that all finger members 140—143 will be retracted or withdrawn when cam 150 is in the position shown in Fig. 8. Secured to the opposite end of hollow shaft 152 is pinion gear 156 which

is in position to engage with interrupted gear 38 (Fig. 7). The ratio of interrupted gear 38 to pinions 36 and 156 is 4:1 so that each pinion is rotated a single revolution during each revolution of interrupted gear 38.

Each finger member 140—143 (Fig. 8) is additionally supported by an arm 160, 160 pivoted on posts 45, 45, and a compression spring 162, 162 extends between the ends of each pair of adjacent arms 160, 160 to urge the finger members toward the center of cavity 90 and to cause cam followers 148, 148 to bear on the margin of kidney cam 150.

It will be apparent from the foregoing description that as pinion 156 is driven by interrupted gear 38, cam 150 will be rotated clockwise through one revolution, as seen in Fig. 8, causing each of finger members 140—143 to advance to the center of cavity 90 through aperture 139, then retreat to its starting position, the movement of the finger members occurring in sequence beginning with finger member 140. Because of the angular spacing between followers 148, all finger members are withdrawn when cam 150 is in the position shown in Fig. 8.

The rear or bottom wall of cavity 90 is in the form of a plate 170 (Fig. 6) mounted on push rod 172 supported for sliding movement within sleeve 152. Secured at the inner end of push rod 172 is a cap 174 carrying cam follower roll 176. Mounted about push rod 172 between cap 174 and an internal shoulder of sleeve 152 is compression spring 178 which serves to urge push rod 172 to the right as seen in Fig. 6 to engage shoulder cam 86.

Power for the apparatus is supplied from an electric motor (not shown) through belt drive 180 (Fig. 7) to gear reduction unit 182 which in turn drives, through chain 184, sprocket 186 which is connected through a single revolution clutch 188 (Fig. 3) to main drive shaft 40. A control solenoid 190 mounted on intermediate support 44 serves to actuate clutch 188, the solenoid being energized when switch 192 (Fig. 1) is actuated by passage of the block of hamburger into frame 100.

In operation of the machine, a hamburger block 16 slides from molding machine 14 down inclined slide 17 into frame 100 where it rests on platen 120. As the block passes switch 192 (Fig. 1) solenoid 190 is energized, actuating clutch 188 to connect sprocket 186 with main drive shaft 40 for a single revolution. As the shaft rotates carrying with it cam 88 the latter is rotated clockwise from the starting position shown in Fig. 7, carrying with it shoulder cam 86. As shoulder cam 86 passes beneath cam follower 58 on push rod 54 (Figs. 4 and 7) cutting knife 72 is reciprocated to the left as seen in Fig. 4 through the action of the rack and pinion connection, thereby severing a web or length of sheet wrapping material 18 from the continuous length or roll of wrapping material which had been advanced downwardly across the open face of cavity 90 at the end of the preceding cycle. At the same time resilient gripping member 80 is yieldingly urged against the sheet wrapping material 18 immediately beneath the knife to hold the severed length in place during the cutting operation.

As cam 88 continues to rotate, cam follower 134 is moved outwardly along with slide 130 in guide 132, thus rotating sprocket 110 by means of chain 122 and urging platen 120 toward cavity 90. As platen 120 advances, frame 100 is carried with it by reason of the spring 116 yieldingly connecting arm 112 with bracket 102. Cam 88 and shoulder cam 86 are so arranged that hamburger cake 16 is urged by platen 120 against the wrapping material 18 to hold the latter in place before the latter is released by the retreat of gripping member 80. When frame 100 and platen 120 reach the position shown in Fig. 9, frame 100 stops while platen 120 continues to advance to the position shown in Fig. 10, urging the hamburger block 16 into cavity 90 and carrying before it the midportion of the web or length of wrapping material 18 which is gathered about block 16 while leaving the marginal portions thereof extending outwardly through the aper-

ture or open face of the cavity, as seen in Fig. 10. When the lobe of cam 88 (which appears at the top of Fig. 7) passes beneath follower 134, the latter is then permitted to recede slightly to ride on intermediate surface 200, causing platen 120 to retreat to the position shown in Fig. 11 while frame 100 remains resiliently urged against the outer face of panel 10. At this point gear teeth 204 on the periphery of interrupted gear 38 engage pinion 156 (Figs. 6 and 7), causing cam 150 to rotate through a single revolution. As cam 150 rotates clockwise as seen in Fig. 8, it permits finger member 140 to be urged toward the center of cavity 90 through aperture 139 to the position shown in dotted lines in Fig. 8, carrying the marginal portion of the web of wrapping material 18 before it and infolding it across the rear face of block 16 as seen in Fig. 11. As cam 150 continues to rotate clockwise, the remaining fingers 141, 142, 143 in sequence are reciprocated to the midpoint of cavity 90, thus infolding the marginal portions of sheet wrapping material 18 across the rear face of block 16 from all four sides. As the last finger member 143 is withdrawn, the teeth 204 of interrupted gear 38 pass beyond and out of engagement with pinion 156 so that rotation of cam 150 and operation of the fingers ceases.

At this point the second lobe of cam 88 (which appears at the bottom of the cam as shown in Fig. 7) passes beneath follower 134, causing platen 120 to advance a second time into cavity 90 as seen in Fig. 12 and to press against the infolded portions of sheet wrapping material 18 over the rear face of block 16. Since platen 120 is heated, the heat and pressure cause the folds of wrapping material to be heat-sealed together.

As rotation of shaft 40 with cam 88 continues toward its starting position, as shown in Fig. 7, shoulder cam 88 engages follower 176 (Figs. 6 and 7), urging plate 170 to the left as seen in Fig. 6 and ejecting the sealed wrapped package from the cavity in preparation for the next cycle. The completed package is shown in Fig. 5. Plate 170 is then returned to its original position by spring 178.

Finally, during rotation of shaft 40 and interrupted gear 38 to their starting position, gear teeth 204 engage pinion 36 (Figs. 4 and 7), driving feed roll 24 and causing the sheet wrapping material 18 to be advanced downwardly over the open face of cavity 90. When shaft 40 has returned to its starting position as shown in Fig. 7, the gear teeth 204 have been disengaged from pinion 36, permitting feed roll 24 to stop. The diameter of feed roll 24 is arranged to advance the appropriate length of wrapping material 18 across the open face of cavity 90 during its revolution.

When shaft 40 together with interrupted gear 38 and cam 88 have completed one revolution and returned to their starting position as shown in the drawings, clutch 188 disengages, permitting sprocket 186 to rotate freely while shaft 40 is stopped. The machine is then ready to start a new cycle upon actuation of switch 192. The device of the present invention is capable of wrapping articles at the rate of 20 per minute.

Although specific embodiments of the invention have been described herein, it is not intended to limit the invention solely thereto, but to include all of the obvious variations and modifications within the spirit and scope of the appended claims.

I claim:

1. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for maintaining a web of wrapping material across said open face, means for advancing said article through said open face into said cavity carrying with it the midportion of the web with the marginal portions thereof extending outwardly through said open face, means for infolding said extending marginal portions about said article to provide a wrapped article, means for ejecting said wrapped article from said cavity, drive means for actuating in sequence said article-advancing means, 75

said infolding means, and said article-ejecting means, and means responsive to the introduction of said article into said article-advancing means for actuating said drive means.

2. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for maintaining a heat-sealable web of wrapping material across said open face, means for advancing said article through said open face into said cavity carrying with it the midportion of the web with the marginal portions thereof extending outwardly through said open face, means for infolding said extending marginal portions in sequence along the periphery of said article to provide a wrapped article, and means for heat-sealing said infolded marginal portions to each other.

3. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for advancing a web of wrapping material across said open face from a continuous supply of said material, means for severing from said supply a length of said wrapping material as it overlies said open face and for holding the severed length in position, means for advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, and means for infolding said extending marginal portions in sequence along the periphery of said article to provide a wrapped article.

4. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for advancing a web of wrapping material across said open face from a continuous supply of said material, means for severing from said supply a length of said wrapping material as it overlies said open face and for holding the severed length in position, means for advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, a plurality of finger members mounted for reciprocation across said open face, and means for reciprocating said finger members individually in sequence across said face to infold sequentially along the periphery of the article said projecting marginal portions about said article to provide a wrapped article.

5. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for advancing a web of wrapping material across said open face from a continuous supply of said material comprising a driven friction feed roll frictionally engaging said material in advance of its passage across said open face, means for severing from said supply after it has passed said feed roll a length of said wrapping material as it overlies said open face and for holding the severed length in position, means for advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, a plurality of finger members mounted for reciprocation across said open face, means for reciprocating said finger members individually in sequence across said face to infold said projecting marginal portions about said article, and means for ejecting said wrapped article from said cavity.

6. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, a friction feed roll for advancing a web of wrapping material across said open face from a continuous supply of said material, means between said feed roll and said open face for severing from said supply a length of said wrapping material as it overlies said open face and for holding the severed length in position,

7

means for advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, a plurality of finger members mounted for reciprocation across said open face, means for reciprocating said finger members individually in sequence across said face to infold said projecting marginal portions about said article, and means for heat-sealing said infolded marginal portions to each other.

7. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, a friction feed roll for advancing a web of wrapping material across said open face from a continuous supply of said material, means between said feed roll and said open face for severing from said supply a length of said wrapping material as it overlies said open face, means between said severing means and said open face for temporarily holding said wrapping material in position during the severing operation and for holding the severed length in position, means for releasing said holding means while advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, a plurality of finger members mounted for reciprocation across said open face, means for reciprocating said finger members individually in sequence across said face to infold said projecting marginal portions about said article, means for heat-sealing said infolded marginal portions to each other, and means for ejecting said wrapped article from said cavity.

8. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for temporarily holding a heat-sealable web of wrapping material across said open face, a heated platen mounted for movement into and out of said cavity through said open face, means for releasing said holding means while advancing said platen into said cavity carrying said article ahead of it to gather the midportion of said web about said article with the marginal portions thereof extending outwardly through said open face, means for withdrawing said platen outwardly beyond said open face while leaving said article and the midportion of said web within said cavity, a plurality of finger members mounted for reciprocation across said open face, means for reciprocating said finger members individually in sequence across said face to infold said projecting marginal portions about said article, and means for again advancing said heated platen into said cavity to press said infolded marginal portions of the web against the article to seal the same and provide a sealed wrapped article.

8

9. Apparatus as defined in claim 8 comprising in addition means for ejecting the wrapped article from said cavity through said open face.

10. Apparatus as defined in claim 9 comprising in addition means for advancing a length of heat-sealable wrapping material across said open face from a continuous supply of said material, and means for severing a web from said length as it overlies said open face.

11. In an apparatus for wrapping an article comprising an open-faced rectangular cavity for receiving the article to be wrapped with sheet wrapping material disposed about the bottom and sides of the article and with the marginal portions of the wrapping sheet extending outwardly through said open face, finger members mounted for reciprocation across said open face from each of the four sides thereof, a single rotatable kidney-shaped cam for controlling the reciprocation of said fingers, a cam follower connected to each finger, said cam followers being arranged in circular array about the axis of rotation of said cam with the angular distance between one adjacent pair of cam followers being twice the angular distance between all other adjacent pairs of cam followers.

12. Apparatus for wrapping an article comprising an open-faced cavity adapted to receive the article to be wrapped, means for advancing a web of wrapping material across said open face from a continuous supply of said material comprising a driven friction feed roll frictionally engaging said material in advance of its passage across said open face, means for severing from said supply after it has passed said feed roll a length of said wrapping material as it overlies said open face and for holding the severed length in position, means for advancing said article through said open face into said cavity carrying with it the midportion of the severed length of wrapping material with the marginal portions thereof extending outwardly through said open face, a plurality of finger members mounted for reciprocation across said open face, means for reciprocating said finger members across said face to infold said projecting marginal portions about said article, and means for ejecting said wrapped article from said cavity.

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