

March 10, 1942.

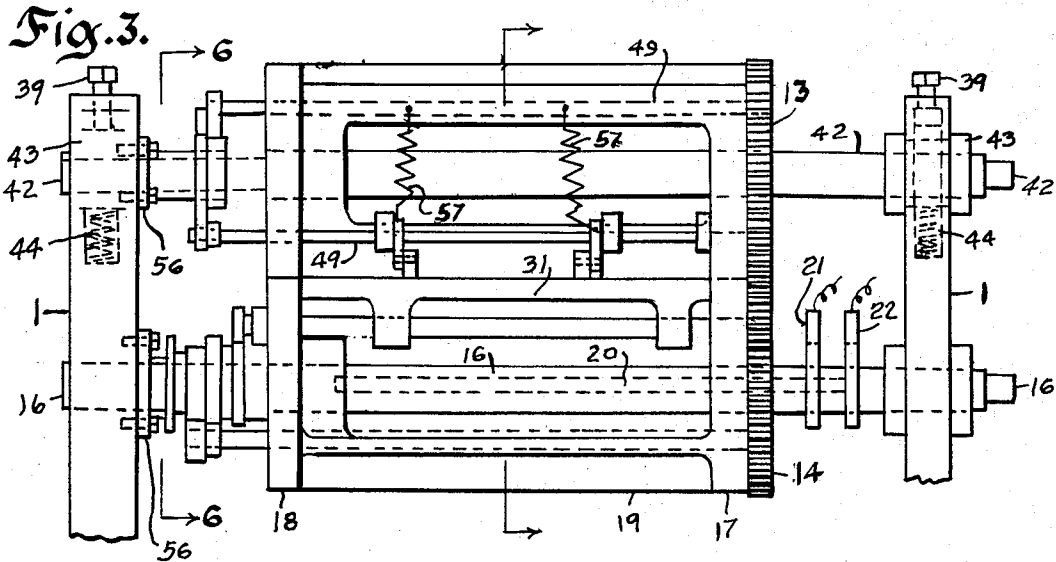
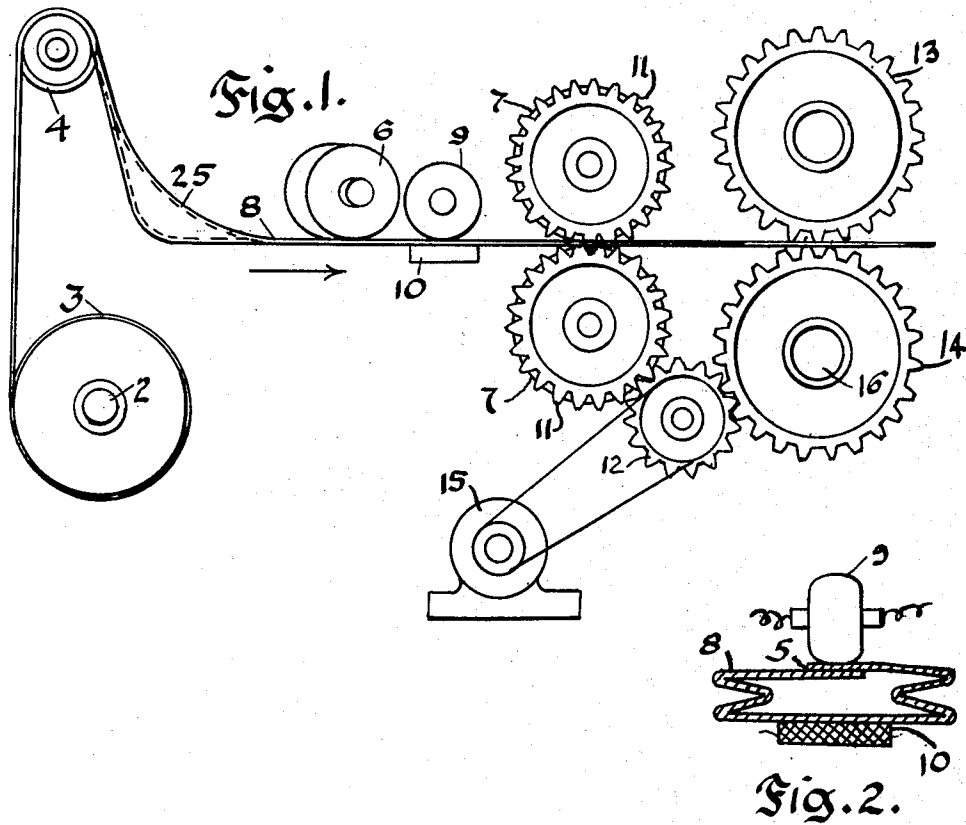
H. A. MEAD

2,275,976

FOLDING, SEALING AND CUTTING MECHANISM

Filed June 24, 1940

3 Sheets-Sheet 1



Harry A. Mead INVENTOR.
BY F. K. Caswell ATTORNEY.

March 10, 1942.

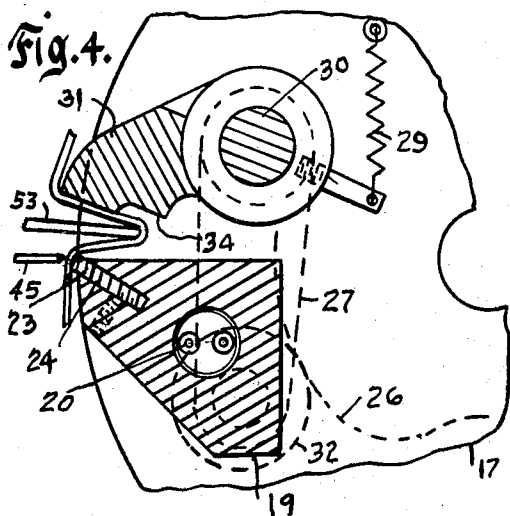
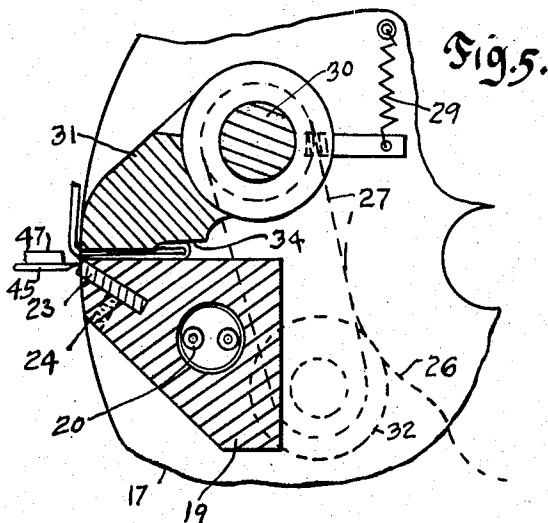
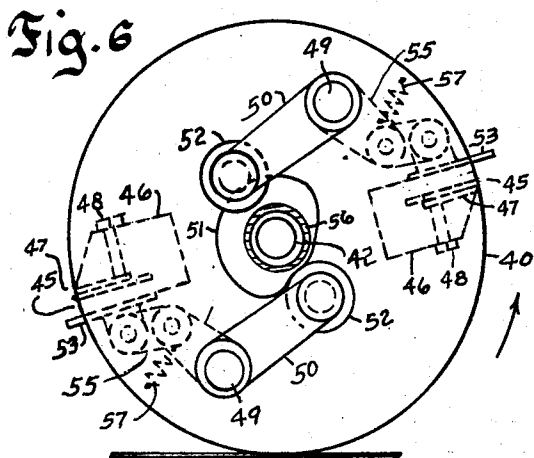
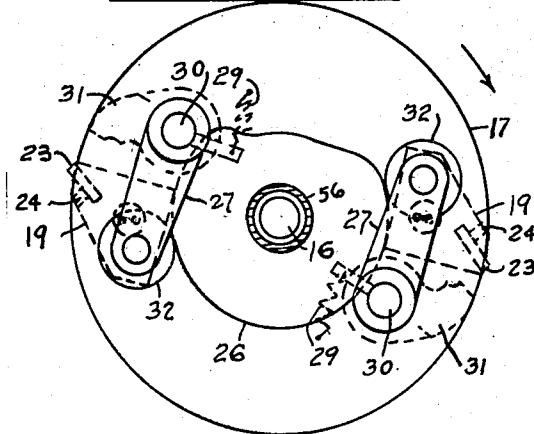
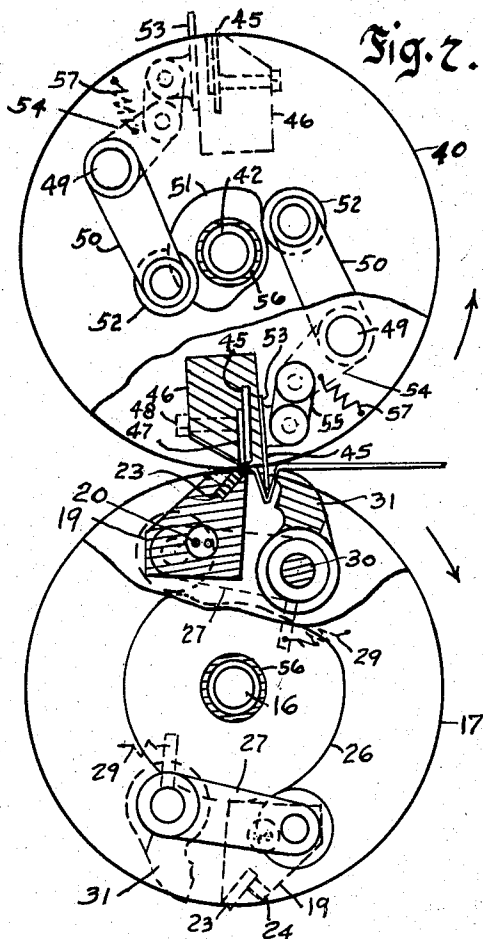
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FOLDING, SEALING AND CUTTING MECHANISM

Filed June 24, 1940

3 Sheets-Sheet 2



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FOLDING, SEALING AND CUTTING MECHANISM

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3 Sheets-Sheet 3

Fig. 10.

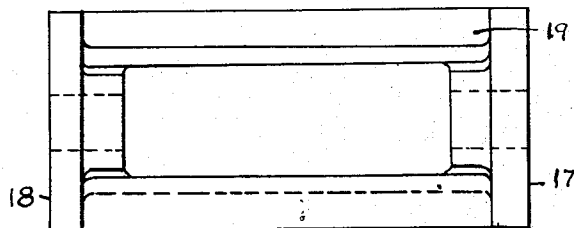


Fig. 11.

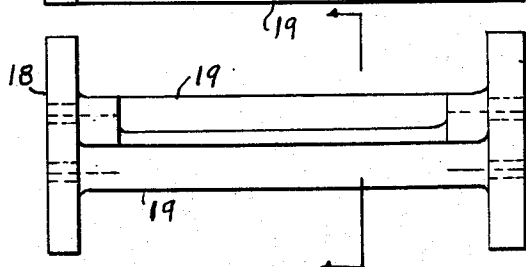


Fig. 12.

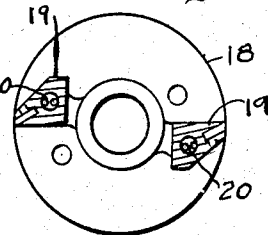


Fig. 8.

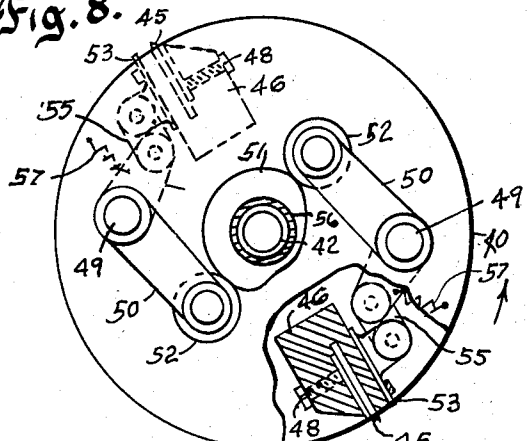
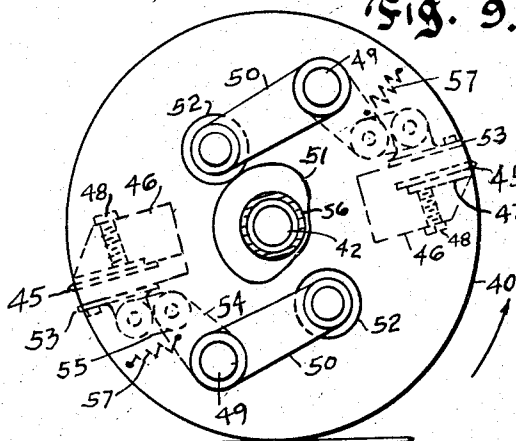
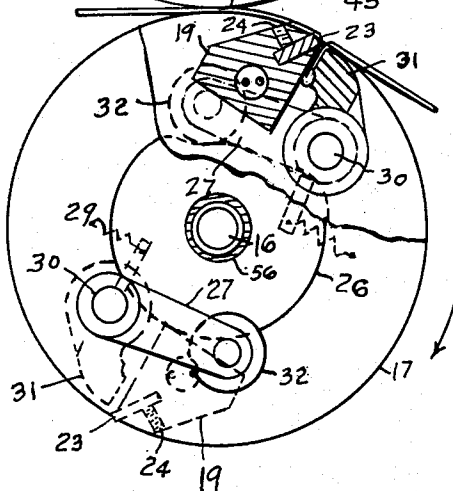
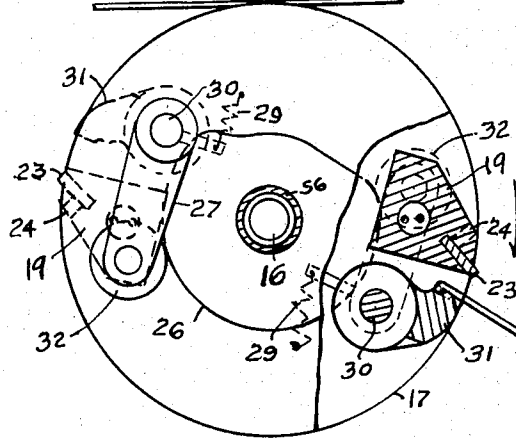


Fig. 9.



INVENTOR.

BY *Harry A. Mead.*
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UNITED STATES PATENT OFFICE

2,275,976

FOLDING, SEALING, AND CUTTING
MECHANISM

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Application June 24, 1940, Serial No. 342,099

2 Claims. (Cl. 93—18)

My invention relates to that class of machinery used in connection with the manufacture of bags, and particularly to bags made of Cellophane or other similar materials. Various machines have been designed for this class of production, and my invention includes an improved mechanism for the manufacture of such bags.

The purposes of my invention are as follows:

1st. To provide a means for forming and sealing the sides and bottom of such bags.

2nd. To provide means for forming a reinforcement in the bottom seal.

3rd. To provide a cushioned heating mechanism for sealing the side of the bag.

4th. To entirely complete the bag and then cut it off from the continuous strip of material being folded and sealed.

I illustrate my invention by means of the accompanying drawings in which similar numbers refer to similar parts in the several views. Figure 1 is a diagrammatic view showing the method of feeding the material into the machine through the side-folding and sealing mechanism, and the relative location and arrangement of the revolving heads, which carry the bottom folding, sealing and cutting-off mechanism. Figure 2 is a sectional view through the bag, with the folds separated to better illustrate the electrically heated side-sealing mechanism. Figure 3 is a front elevation of the machine. Figure 4 is an enlarged sectional view of the gripper and sealer in the open position, with the tucker and cutting off knife in position to fold and cut off the finished bag. Figure 5 is an enlarged sectional view of the gripper and sealer in its closed position, with the bag between them being electrically heated, sealed and cut off. Figure 6 is a sectional end view of the upper and lower headers, partly diagrammatic, taken on the line 6—6 of Figure 3, and showing the tuckers and cutters, as well as the bottom sealer in their preliminary position. Figure 7 is a similar sectional end view, partly diagrammatic, of the upper and lower headers with parts of each broken away to more clearly illustrate the action of the tucker and the cutting-off knife, which are shown in their operating position. Figure 8 is a similar sectional end view, partly diagrammatic, of the upper and lower headers with parts of each broken away to more clearly illustrate the bottom sealing operation with the gripper closed and holding the bottom of the bag between the gripper and the hot sealing anvil. Figure 9 is a similar sectional end view, partly diagrammatic, of the upper and lower headers with parts broken away to more clearly illustrate the opening of the gripper and the discharge of the bag, after having been cut off as shown in Figure 7. Figure 10 is a plan view of one of the lower headers without the associated parts. Figure 11 is a

front elevation of one of the lower headers, and Figure 12 is an end view of one of the lower headers.

Similar numerals refer to similar parts in the several views.

The construction of my device is as follows:

1 is a frame of a design suitable to have mounted thereon various shafts, bearings and other essential parts. Rotatably mounted on the shaft 2 is a roll of material 3 which is threaded up and over a roller 4, and then downwardly to the working table of the machine. The material 3 then passes over and around a forming plate 25 which curls the sides of the material, folding it into an unsealed flat tube 8, with the seam 5 uppermost. This curling process is aided by the rolls 6 which have their axes set on converging angles, and which by their rubber or other friction covering, draw the two sides toward each other; the degree of bag width and the amount of curl being determined by the angle to which these draw rolls 6 are set, and by the shape of the forming plate 25. The material also passes under the drag-rolls 7, which have their axes set at right angles to the direction of material movement. These drag-rolls 7 are also covered with friction material which will insure their dragging effect on the bag material. The material 3 as it is drawn forward now has its two edges overlapping each other and lying flat along the center, forming the tube 8. Between the rolls 6 and the rolls 7 is an electrically heated roll 9, and under this roll and also under the tube 8 is a heat resisting pad or cushion 10, which provided a resilient support to the tube 8 as it is sealed by the heat applied to the seam 5. The resilience of the pad 10 insures a more perfect contact and a more perfect seal of the seam 5. After being sealed into a tube 8 the bag material 3 passes between the upper header 13 and the lower header 14 where the bag is completed. The machine can be driven by any convenient means, such as the motor 15, driving the pinion 12 and this pinion in turn driving the rolls 7 by means of the gears 11. The header gears 13 and 14 are also driven from this motor, through the pinion 12.

The lower header consists of a shaft 16 journaled in the frame 1, and on which the header itself is mounted, being secured thereto by set screws, and has two discs 17 and 18. The gear 14 is secured to the disc 17 by suitable bolts or screws. Integral with the discs and extending from one to the other are two bars 19 which form the anvil against which the bottom of the bag is pressed when being sealed. These bars 19 are provided with cavities adapted to contain electrical heating elements 20 which are connected with a source of electric power by leads extending from the heating elements through an opening in the shaft 16. Each of these leads con-

nects with the collector rings 21 and 22, which are insulated from the shaft 16 and are provided with suitable brushes, which in turn are connected with a source of electrical power. Along the length of the anvil bars 19 are slots each of which contains a striking bar 23, against which a knife is pressed when cutting off the finished bags. These striking bars are held in their proper position by suitable means such as the set screws 24. Journaled in the disc 17 and extending through and beyond the disc 18 are the cam-shafts 30. Located between the two discs and secured to the cam-shafts 30 are grippers 31 which are adapted to be opened and closed by the partial rotation of the said cam-shafts, the degree of the rotary movement of the cam-shafts and of the grippers being governed by the cams 26 which are stationary, being on a sleeve 56 attached to the frame 1. On the extension of the cam-shafts 30 beyond the discs 18 there are secured to each cam-shaft a lever arm 27, having journaled on its outer end a cam-roll 32 adapted to revolve with the header and ride on the cam 26. The cam-rolls 32 therefore run around the cams and the grippers are held in a normally closed position by means of the springs 29, but are opened at the pre-arranged time according to the shape and the timing of the said cams. The faces of the grippers 31 have a recess 34 at their inner portions, to aid in forming a reinforcing ridge across the bottom of the bag being sealed.

The upper header has two discs 40 and 41, very similar to those of the lower header and has the driving gear 13 attached to the disc 40. The header is also secured to a shaft 42, this shaft being journaled in cross-heads 43, these being slidably mounted in the frame 1. Beneath the cross-heads 43 are springs 44 adapted to hold the cross-heads against the adjusting screw 39. Between the discs 40 and 41 and integral therewith are the knife bars 46. These bars have longitudinally disposed across their outer faces, slots adapted to hold the knives 45, these being provided with adjustable backing strips 47. The knives 45 are adjusted to a preferred position, projecting slightly beyond the face of the bars 46. The knives 45 and the backing strips 47 are secured in position by suitable means such as the set-screws 48. Journaled in the disc 40 is one end of the cam-shaft 49, the opposite end extending through the disc 41 and having secured on its outer end the lever arm 50. These lever arms have journaled in their outer ends the cam-rolls 52. These cam-rolls revolve around the cams 51 and cause the partial rotation of the cam-shaft 49. Along one side or within slots in the knife-bars 46 are tucker-blades 53. These blades are so constructed as to be moved into positions, either projecting out beyond the header or withdrawn within or flush with the face of the said knife-bars. These blades 53 are actuated by lever arms 54 which are secured to the cam-shafts 49 and are connected to the tucker blades 53 by the links 55. The degree of partial rotation of the cam-shaft 49 and also the degree of movement of the tucker blades 53 is governed by the shape and timing of the cams 52, the said cams being carried on sleeves 56 attached to the cross-head 43. The tucker blades 53 are normally held in their withdrawn position by the springs 57.

The operation of the machine is as follows:
The bag material is fed over a forming plate

25 and thence under side-folding and drawing rolls 6, which fold the edges of the material so that a side seam is uppermost and overlapping. The material then passes between the electrically heated roll 9 and the cushion or pad 10. The purpose of the pad is to provide a resilient support insuring perfect contact and a perfect seam 5. The material is now in tubular form 8, with the side seam, sealed. The material feeding mechanism consists of the drag rolls 7 actuated by the gears 11, they in turn being driven by the motor 15 and the pinion 12. The material then passes to the machine proper and is fed between a lower and an upper header, each revolvably mounted in the frame 1, and being driven by the pinion 12 and the gears 13 and 14. The lower header is provided with a gripper bar 31, and an electrically heated anvil 19. The upper header is provided with a knife-bar 46, carrying a folding blade 53 and a cutting-off knife 45. The action of the gripper bar 31 and of the folding blade 53 is determined and controlled by cams and rollers. These cams and rollers operate in conjunction with the gears 13 and 14 to bring the folding blade 53 opposite the opening between the open gripper-bar 31, and the anvil 19, and the cams of the upper header project the blade 53 into the V-shaped opening, carrying the material with it. The folding blade is then withdrawn and the gripper-bar 31 is closed, pressing the V-shaped bottom of the bag against the hot anvil 19, and thus sealing the bag. As the headers rotate, the knife 45 presses against the striker-bar 23 and severs the completed bag from the material, and the bag is then discharged from the machine.

In the drawings there are shown two duplicate sets of folding, sealing and cutting mechanisms. By this means two bags can be completed during each revolution of the headers. On account of these duplicate mechanisms, a duplicate set of cams are provided, but only one set of the cams are shown on the drawings.

What I claim as my invention and desire to secure by Letters Patent is:

1. A bag forming machine comprising in combination, bag material holding means, folding means whereby adjacent edges of the bag material are folded in overlapped relation with each other, an electrically heated roller mounted in the path of the bag forming material, a resilient cushion in operative position with respect to said roller, means whereby the bag forming material is folded and sealed on itself, and a cutting member for severing the formed bag from the strip of bag forming material after the material is folded upon itself and sealed.

2. A bag forming machine comprising in combination, bag material holding means, folding means whereby adjacent edges of the bag material are folded in overlapped relation with each other, an electrically heated roller mounted in the path of the bag forming material, a resilient cushion in operative position with respect to said roller, means whereby the bag forming material is folded and sealed on itself, and a cutting member for severing the formed bag from the strip of bag forming material after the material is folded upon itself and severed, the bag forming material being heated across the area of severance prior to the formed bag being severed from the material.

HARRY A. MEAD.