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2,770,933

METHOD OF FORMING BALLOONS CONTAINING MESSAGES

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Fig. 1

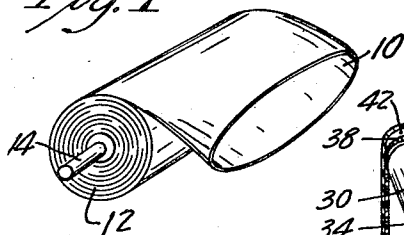


Fig. 2

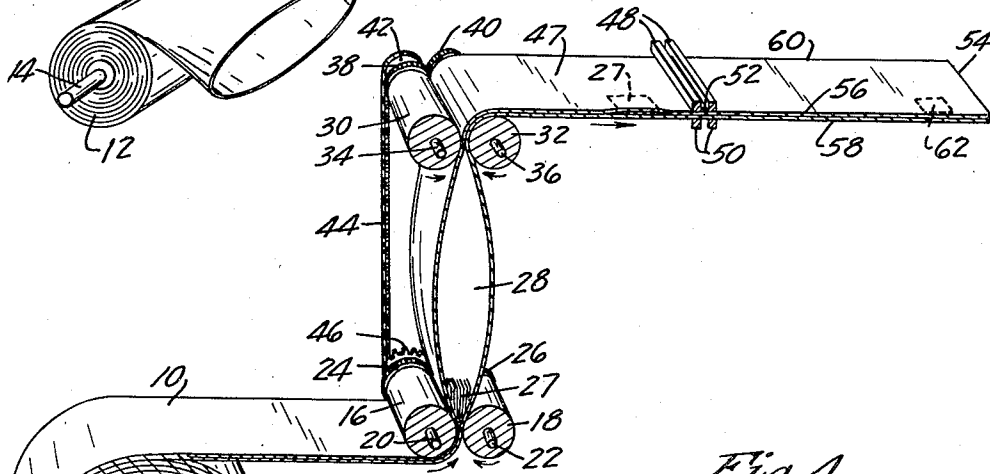


Fig. 4

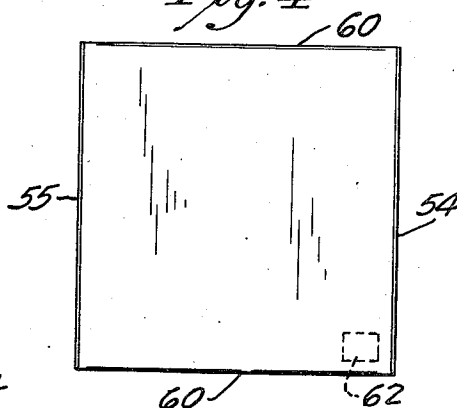


Fig. 3

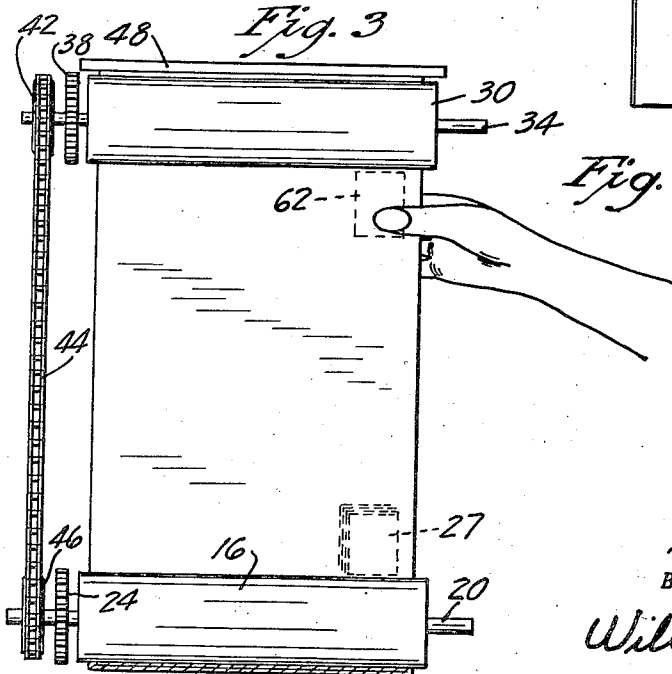
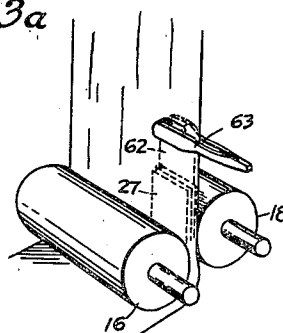


Fig. 3a



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METHOD OF FORMING BALLOONS CONTAINING MESSAGES

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6 Claims. (Cl. 53—29)

This invention relates to improvements in methods of forming a sealed balloon containing an object such as a message.

Small balloons of the type shown in the present application, which are completely sealed and which may contain objects, such as a card or paper containing a message, are disclosed in the co-pending patent application entitled Balloon and Method of Making, Huch and Hakomaki Serial No. 233,282, filed June 25, 1951, now U. S. Patent 2,666,600. To form the balloon of the type shown therein, a sealed balloon envelope is first formed, being flat and having the message enclosed within the envelope. When the balloon is to be flown, an opening is made in the balloon envelope and a volume of lifting gas is placed inside and the opening resealed. The balloons are preferably constructed of a thermoplastic material, such as polyethylene, which is well suited to cutting and quick sealing by mere contact with a heated sealing element. These balloons can be quickly and cheaply made and used for a multiplicity of purposes and when flown utilize the air currents for their movements. The present invention concerns itself with a rapid economical method of placing a message within each of the balloons accomplishing a saving of time and labor.

An object of the present invention is to provide a method which will readily adapt itself to economical, rapid mass production of balloons containing messages by providing a simplified and improved operation for inserting a single message into each of the balloons.

A further object is to provide a method for making balloons from a continuous roll of tubular material and forming a series of balloons by simultaneously cross sealing and cutting the end off the tubular material and sealing the leading edges of the tubular material and trailing edges of the separated balloon and by placing a single message within each of the balloons before sealing, eliminating the necessity of opening and resealing the material.

Other objects and advantages will become apparent from the following specification taken in connection with the accompanying drawings, in which

Figure 1 is a perspective view of the roll of tubular balloon forming material;

Fig. 2 is a perspective view having the front portion broken away to illustrate the apparatus and method for forming the message-containing balloons;

Fig. 3 is a front elevation illustrating the method of placing a unit message in each balloon;

Fig. 3a is a perspective of a detail; and

Fig. 4 is a plan view showing the completed balloon with a message therein.

In forming a unit balloon, which contains a message, from a thermoplastic material, it is expedient to use a tubular stock which is readily available on the market. Single balloons can be formed from thermoplastic by cutting off the ends of the material by means of a heated severing instrument, such as a wire. This heated instrument, passing through the material, seals the opposed

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severed edges of the material together to form a closed edge on the trailing end of the section of material which is severed from the supply roll and which forms the rear edge of the balloon. The heated instrument also forms a seal on the forward end of material on the supply roll which will form the leading edge of the succeeding balloon. Thus, with one operation, three functions are performed, the cutting and also the sealing of each of the two ends. As this step is continually repeated, a series of rectangular closed envelopes are formed, being closed on their side edges by virtue of the fact that the material was tubular in form and being closed on their ends by the sealing action of the heated severing member. With the utilization of this quick method of formation of closed balloon envelopes, normally the envelopes must be again re-opened to insert the message. If the message or object is bulky in size, the opening must of necessity be a large one, thereby losing the advantage gained in the severing and cutting by one operation. With the present method and apparatus, the inventors have accomplished the insertion of unit objects or messages into each balloon prior to the sealing, thereby obviating the necessity of re-opening the sealed envelope.

Referring to Fig. 1, the stock or supply of tubular material 10 is shown carried in a roll 12, the roll being supported on its axis 14. This tubular material may be formed of any type of suitable balloon stock but it is preferable to use a thermoplastic material such as polyethylene which is susceptible to cutting and sealing with a heated member.

Fig. 2 shows the material being threaded from the supply roll to the apparatus for placing separated objects in each of the balloon envelopes and for severing the envelopes from the stock. The present embodiment shows sheets of paper or cards being inserted in each of the envelopes but it will be readily understood that the method may be used and the apparatus readily adapted to inserting other types of objects into each of the sealed envelopes.

The flattened tubular material drawn from the supply roll is first fed between the bite of a pair of feed rollers 16 and 18 rotating in the direction indicated by the arrows to withdraw the material from the roll. The rolls are supported on their shafts 20 and 22 which are suitably mounted for rotation and which on their far ends carry meshing spur gears 24 and 26 to rotate the rolls at the same peripheral speed. Resting inside the tubular material on the upper side of the rolls is a plurality of messages 27 from which unit messages are to be separated and fed singly into the balloon envelopes.

This stack of messages is first placed inside the tubular material when the roll is started by being dropped into the open end of the material. The tubular material is then opened as to hold a volume of air and the air pushed along inside the material to form a pocket. To hold this air in the pocket formed, as pictured at 28, the material is then fed between two upper rollers 30 and 32 which squeeze the material flat, preventing the air from moving forward through the tubular material and escaping to atmosphere. This pocket of air keeps the opposing layers of material separated so that the group of messages 27 will not bind or be pinched by the layers of material and will stay at the bottom of the air pocket. If the air is not pushed along and held in a pocket, some will remain in each balloon that is formed and the tubular material will collapse and the stack of messages will soon bind within the material. The pinching rolls 30 and 32 are located directly above the lower feed rolls 16 and 18 so that the section of material containing the air pocket is vertical and as the material is advanced the stack of messages will always drop down

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and remain in the same place and not be advanced with the material.

The upper pinch rolls obviously must rotate at the same speed as the lower rolls to advance the material evenly. The rolls are supported on shafts 34 and 36 which are suitably mounted for rotation and which have meshing spur gears 38 and 40 mounted on one end. Shaft 34 has mounted on its end (Figs. 2 and 3) a sprocket 42 over which runs a chain 44. The lower end of the chain runs over sprocket 46 which is mounted on the shaft 20. This lower shaft 20 is driven by a suitable power means which rotates the lower drive rollers and through the chain 44 drives the upper rollers at the same speed.

The flattened material 47, after leaving the pinch rollers, is led horizontally between a severing sealing device. This device consists basically of a pair of spaced upper clamping bars 48 and a pair of cooperating spaced lower clamping bars 50. These upper and lower bars are brought securely against the material to flatten it and force the opposing layers of the tubular material tightly together. The heated severing and sealing member 52 which is shown in the form of a wire is then brought down through the space between the clamping bars to be forced through the clamped layers of material. The heat of the wire melts the material, severing it and fusing the severed ends to form seams on the severed edges across the material. At the forward end of the material a seam 54 has been formed from the previous operation. Therefore, each succeeding severing and sealing operation will form a sealed balloon envelope 55 formed of the upper layer of material 56 and the lower layer 58, the layers being sealed at their four edges. The side edges 60 (Fig. 4) are sealed by virtue of the fact that the material is tubular in form and the ends are sealed by the beads 54 and 55 formed by the severing sealing wire 52. Each of these envelopes has hermetically sealed within it a message 62.

To insert a single message into each of the balloon envelopes before their sealing and without necessitating a separate cutting and sealing, a single unit message is withdrawn from the stack of messages 27, as shown in Fig. 3. This can be done by hand by tightly squeezing the layers of material over a single message between the thumb and forefinger or it can be done by mechanical means 63, Fig. 3a, or perhaps electrostatic means. Since the stack of messages is lying loosely within the material, the edges of the stack are uneven and a single message is easily grasped by choosing one which extends from the stack. Also, the balloon material is thin and flexible and the messages can be manually separated through the material. As the material is fed upwardly, this single message is held tightly between the layers of material and is carried upwardly with it while the stack of messages remains behind, dropping down between the layers of material. The message feeds up between the bite of the upper rollers 30 and 32 and passes therebetween to be advanced with the material. The rollers have a soft surface which compresses to compensate for the extra thickness of the message. If a more bulky object is to be fed between the rollers the rollers will be designed with a softer surface, such as sponge rubber, to permit a thick object to pass therebetween.

If more than one message is to be placed in a balloon envelope, the desired number can be separated from the stack, in substantially the same manner as separating a single message, and fed up between the rollers. It will readily be seen that stacks of different messages could be placed within the tubular material and one of each kind fed up between the rollers to be placed in each of the balloon envelopes.

After the forward edge of the material is sealed by bringing the heated wire through the sheets of thermoplastic material and severing the forward end therefrom, the clamping bars 48 and 50 are released from the ma-

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terial and it is carried forward advancing the message with it between the layers. The clamping bars are again brought down to clamp the material between the single message 62 and the upper pinch rollers 30 and 32. The thermoplastic is then severed to form a cross seal located between the message and the rollers, thereby forming a sealed balloon envelope with a single message inside it. It will be seen that the cross sealing and cutting could be done further along the material, leaving several messages between it and the squeezing rollers.

The product, shown in Fig. 4, may then be stacked for storage or for transportation and the message will be hermetically sealed and protected until such time as the balloon is to be inflated for release.

Briefly reviewing the method of the present invention, the steps comprise first placing a plurality of objects within the open end of a length of tubular material. A bite of air is then taken within the material to form a pocket around the messages. This bite of air, although not absolutely necessary to the carrying out of the process, prevents the messages from being pinched by the opposing layers of material and greatly aids the ease of separation of a unit message from a stack. A message is then separated from the plurality of messages and carried with the material as it is advanced. The remainder of the messages are permitted to drop down through the tubular material to separate them from the individual message. These messages could be aided in their movement by vibrating or shaking the material. The material is then given a cross seal at its forward edge to begin the process. It is not necessary to repeat this cross seal as each severing of an end from the material will yield a cross seal at the leading edge. As the material is advanced it is then severed at a point between the stack of messages and the separated unit message to separate an individual balloon from the length of tubular stock. Accompanying the severing of the material is the sealing of the separate edges to seal the trailing edge of the severed balloon envelope and sealing the leading edge of the next succeeding balloon envelope.

Thus it will be seen we have provided a simple and efficient method of forming a balloon envelope which is completely sealed and which contains a message. This formation has been done with a minimum number of steps and has availed a great saving in time and effort and is especially adaptable to high speed mass production operation.

We have, in the drawings and specification, presented a detailed disclosure of the preferred embodiment of our invention, but it is to be understood that as the invention is susceptible of modifications, structural changes and various applications of use within the spirit and scope of the invention, we do not intend to limit the invention to the specific form disclosed but intend to cover all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by our invention.

We claim as our invention:

1. The method of making a series of sealed object-containing balloon envelopes comprising the steps of placing a plurality of objects within a length of tubular stock, moving the entirety of said objects except one along within the tubular stock, and cross sealing the flattened opposed layers of the tubular material between said one object and the remainder of objects.

2. The method of making a series of object-containing balloon envelopes comprising the steps of inserting a plurality of objects within the open end of a supply of tubular shaped balloon material, placing air within the tubular shaped material so as to form a pocket of air at the location of the objects, sealing the opposed layers across the material between the objects and the open end, retaining at least one of said objects in its place in the tubular material and moving the remaining objects along within the material, simultaneously moving the air pocket along

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within the material with said objects, sealing the opposed layers of material together across the material between the separated object and said remaining objects, and severing the end from the material at the seal, the separated end forming a balloon envelope containing an object.

3. The method of making a series of message-containing balloons comprising the steps of inserting a plurality of messages within the open end of a length of tubular material, forming a pocket of air in the material, sealing the opposing layers together across the material between the messages and the open end, separating one of said messages and holding it stationary in the material, positioning the section of material containing the messages vertically to drop the remainder of the messages along within the tubular material, and sealing the opposing layers of material together across the material and severing the sealed end from the material, the severed end forming a balloon containing a message.

4. The method of making a series of message-containing balloons comprising the steps of inserting a plurality of messages in the open end of a length of tubular thermoplastic material, closing the end of the tubular material by a cross heat seal, separating one of said messages within the material and removing the remainder along the material, flattening the opposed layers of material between said one message and the remainder, and moving a heated severing and sealing member through the flattened material to separate a message-enclosing sealed section from the end of the material.

5. The method of making a series of sealed objects containing balloon envelopes comprising the steps of placing a plurality of objects within a continuous length

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of tubular material so that the objects are completely enclosed therein, moving the plurality of objects forward within the material while holding at least one object back to remain stationary with respect to the tubular material until the remainder of the objects are substantially separated from said held object, and cross sealing the tubular material between said held object and the remainder of the objects.

6. The method of making a series of sealed objects containing balloon envelopes comprising the steps of placing a plurality of objects within a supply of tubular material to be enclosed therein, cross sealing the end of the supply of tubular material, maintaining one of the objects in place within the tubular material to be stationary relative thereto and moving the remainder of the objects within the tubular material supply away from the cross seal until the objects are spaced from said one object, cross sealing the material between said one object and the remainder of the objects, and cutting the end containing the enclosed one object from the supply to form a separate balloon envelope.

References Cited in the file of this patent

UNITED STATES PATENTS

2,336,962	Salfisberg	Dec. 14, 1943
2,374,504	Salfisberg	Apr. 24, 1945
2,432,373	Bleam et al.	Dec. 9, 1947
2,469,975	McCloy	May 10, 1949
2,475,359	Piazz	July 5, 1949
2,490,930	Thompson	Dec. 13, 1949
2,530,400	Rado	Nov. 21, 1950
2,615,375	Rowe	Oct. 28, 1952