

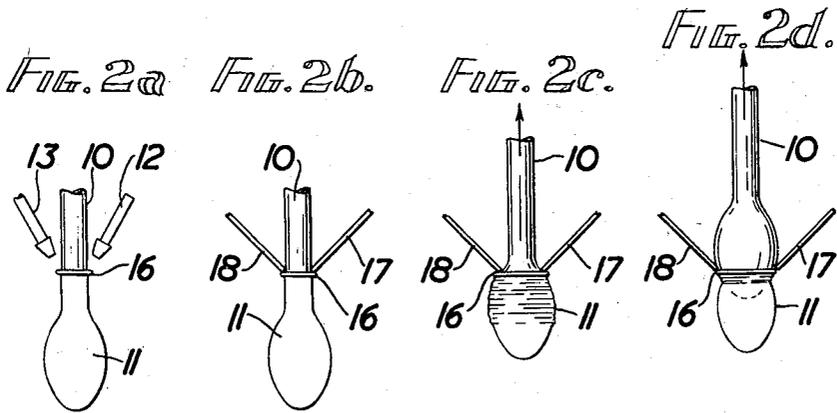
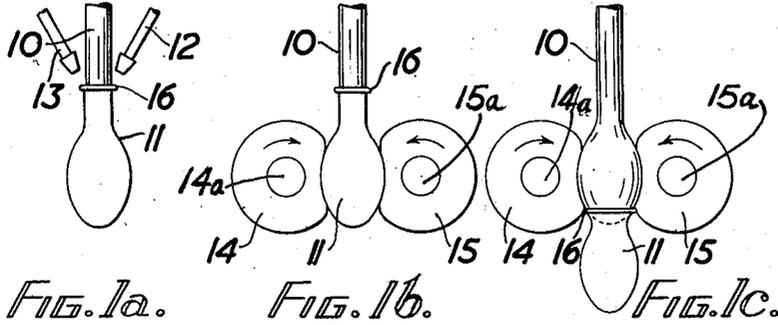
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MANUFACTURE OF TOY BALLOONS

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MANUFACTURE OF TOY BALLOONS

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This invention relates to improvements in the manufacture of toy balloons and is concerned with the method of detaching the rubber balloon from the former on which it is made.

As is well known, toy balloons are manufactured by depositing the rubber on a former which consists of a rod with a pear-shaped end so that when detaching the finished balloon from the former, it is necessary to stretch the narrow neck of the balloon over the pear-shaped end of the former, and this is an operation which is difficult to perform on a large scale by machinery and has mostly been carried out by manual labour which is very slow and involves a tremendous amount of unnecessary manual labour.

It is an object of the present invention to provide a method for removing the finished balloon mechanically from the former and these special means might be adapted to operate on the machines employed for producing toy balloons in large quantities.

The invention will be described specifically with relation to toy balloons, but it will be obvious that the method will be equally applicable to other articles such as finger stalls and gloves formed in a similar way, i. e. by dipping a former into a rubber dispersion up to a predetermined position, coagulating a rubber film thereon, and forming a beaded edge at the termination of the rubber film.

The method of detaching rubber balloons and like articles from the formers on which they have been made by a dipping process according to the invention, comprises injecting a small quantity of liquid lubricant into the neck of the balloon on the former, and then passing the former with the balloon thereon between and in close contact with the surfaces of two resilient bodies, and setting up relative movement between the surfaces in contact in a direction tending to move the position of contact of the contacting surfaces in the direction towards which the rubber balloon is to be moved from off the former.

The resilient bodies may conveniently be formed of cellular rubber, either closed cell (expanded) or open cell (sponge), but brushes or other bodies may be used.

The invention is not concerned with the actual composition of the balloon material or of the resilient rubber bodies used in the method of stripping according to the invention, and the term "rubber" is used herein in its broadest sense as including rubber-like elastomers employed as substitutes for rubber.

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According to one specific way in which the invention may be carried into effect, a liquid having no solvent action on the rubber may be injected between the beaded edge of the balloon or like article, and the neck of the former. The widest part of the former is then inserted between two resilient rubber discs or rollers rotating in opposite directions on substantially parallel axes spaced apart at a distance such that close contact between the rubber on the former and the periphery of the resilient disc is made, the end of the former on which the rubber is formed being directed in the direction of feed between the discs. In this way friction between the soft rollers and the rubber on the former with the aid of the liquid injected behind the beaded edge draws the balloon rapidly from the former and ejects it. It is sufficient to direct a jet of the liquid against the stem of the former at a point on the line of contact between the rubber and the former, and in this case sufficient liquid is forced under the rubber for the purpose in view. The liquid may conveniently be water and may contain a lubricant such as soap.

Additional help in drawing the balloon from the former may be afforded by providing a jet of air as well as a jet of water so that both air and water are forced behind the beaded edge of the rubber on the former.

In a modified form of the invention employing a water jet and if desired an air jet as above described, the neck of the former above the beaded edge of the rubber thereon may be inserted between and in close contact with two resilient rubber bodies and the former may be moved in a direction opposite to that in which the rubber is to be moved, whereby the said resilient bodies push the beaded edge along the former beyond the widest part thereof and thus release the balloon. In this case, the resilient rubber body may conveniently take the form of two rubber plates directed against the former at an angle thereto, and the stretching of the beaded edge over the widest part of the former causes the latter to rapidly recover its normal shape after passing the widest part of the former and this shoots the balloon away from the former.

The invention will now be described in greater detail with reference to the accompanying drawing in which:

Figures 1a-c are diagrammatic views of the successive steps in one method according to the invention,

55 Figure 1a showing a rubber balloon on its former

with jets for ejecting liquid and air behind the beaded edge;

Figure 1b showing the same former entered between two cellular rubber discs;

Figure 1c showing the same former immediately afterwards, when the rubber discs have drawn the balloon towards the ejection position of the discs; and

Figures 2a-d are diagrammatic views of the successive steps in another method,

Figure 2a showing the former with the balloon thereon and the jets of liquid and air as in Figure 1a;

Figure 2b showing two flexible members in contact with the beaded edge of the rubber;

Figure 2c showing the positions as the former rises pushing the rubber down the former; and

Figure 2d showing the beaded edge of the balloon pushed beyond the widest part of the former.

In the method illustrated by Figures 1a to c, the former 10 with a rubber balloon 11 thereon provided with a beaded edge 16 has two jets 12 and 13 directed so that fluid passing through the jets is directed against the former at the point of contact between the beaded edge and the former 10. Liquid and air is then injected behind the beaded edge by means of the respective jets 12 and 13 and the former 10 is then passed between two cellular rubber discs 14 and 15 rotated in opposite directions by driving shafts 14a and 15a, respectively. The rubber discs 14 and 15 are yieldably mounted at such a distance as to cause the discs to press against the rubber balloon and being of a soft resilient material they are considerably deformed in pressing against the sides of the rubber balloon, thus giving a large surface of friction which enables the rotary motion of the discs to draw off the balloon straight off as shown in Figure 1c, without rolling up said balloon.

In the method illustrated by Figures 2a to d, air and liquid are injected behind the beaded edge 16 of the balloon 11, by means of jets 12 and 13 respectively and in this case the former 10 with the balloon 11 on it is moved between two cellular rubber plates 17 and 18 each disposed at an angle to the horizontal, so that the lower edges of the plates contact the neck of the former 10 above the beaded edge 16, the two plates 17 and 18 being yieldably mounted in any suitable manner. The former is then moved in an upward direction so that the lower edges of the plates 17 and 18 press against the beaded edge 16 and prevent it rising. Thus with the aid of the lubrication of the liquid previously injected into the beaded neck of the balloon, the latter slides freely upon the former, first to the position shown in Figure 2c and then as the widest part of the former is passed as shown in Figure 2d when the balloon, slightly crumpled in the upper part, slides freely off the former.

It will be clear that in the method of carrying out the invention shown in Figures 2a-d, where the former is moved, the same effect will be obtained if the former 10 remains stationary and the mounting of the resilient plates 17, 18 is moved in the opposite direction, all that is required being the relative movement of the point of contact of each resilient body with the balloon in the direction towards which the rubber is to be moved in order to free it from the former 10.

In order that the pressure between the two

resilient bodies should be even throughout, the yieldable mounting may take the form of a weight suspended from a line passing over a pulley acting so as to draw the two resilient bodies together.

It is to be understood that the above specific ways of carrying out the invention are only given by way of illustration and it will be obvious to those skilled in the art that the methods may be modified in detail. Thus, to facilitate the removal of the rubber article, instead of water and soap solutions, other liquids may be used even liquids having an appreciable solvent action on the rubber. Again in the method in which rubber plates are directed against the neck of the former, instead of using rubber plates, relative motion between the former and resilient bodies may be provided by moving the former in a straight line continuously between resilient bodies of considerable length and fixed in such a manner that they slope downwards in the direction of the tip of the former. In this way a gradual pushing action will be exerted on the products as the formers travel. Furthermore, the resilient bodies may be made of rigid material such as leather, or wood or metal covered with a suitable resilient layer.

I claim:

1. A method of removing toy balloons from the formers on which they are made by a dipping process, which formers comprise a stem forming the balloon neck and an enlarged portion forming the body of the balloon, said method consisting in squirting a jet of lubricating liquid into the mouth of the neck portion, then applying mechanical displacing means to the balloon on the former, and then causing relative axial movement between the displacing means and the former to slide the neck portion of the balloon over the enlarged body portion of the former, the liquid causing the balloon to slide off the former without rolling up.

2. A method according to claim 1, in which a jet of compressed air is squirted into the mouth of the balloon simultaneously with the lubricating liquid and acts to distribute said liquid.

3. A method of removing toy balloons from the formers on which they are made by a dipping process, which formers comprise a stem forming the balloon neck and an enlarged portion forming the body of the balloon, said method consisting in squirting a jet of lubricating liquid into the mouth of the neck portion, then applying a pair of sponge rubber discs to opposite sides of the balloon on the former, and rotating said discs in opposite directions, so that they grip the balloon frictionally and slide it off the former, the liquid assisting said sliding and acting to prevent rolling of the wall of the balloon.

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