Aug. 9, 1932. C. C. SPRAGUE 1,870,825

PROCESS OF PRINTING ON INFLATABLE ARTICLES

Filed Dec. 29, 1930

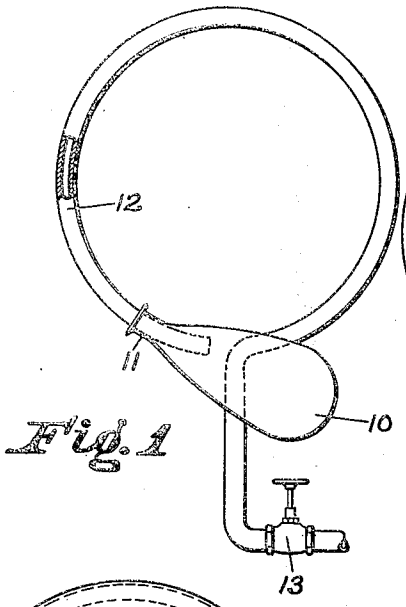


Fig. 1

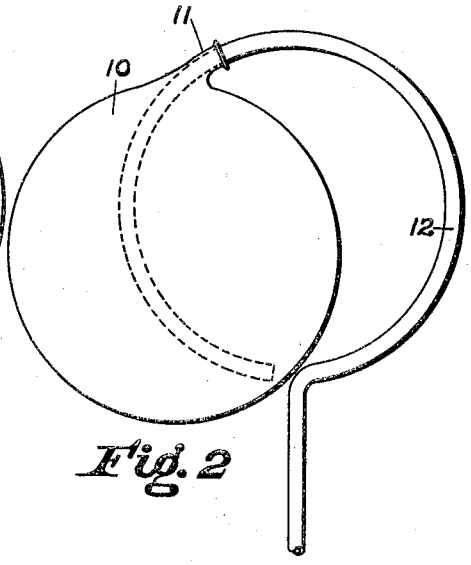


Fig. 2

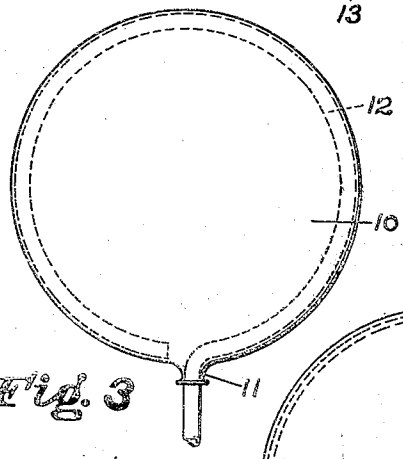


Fig. 3

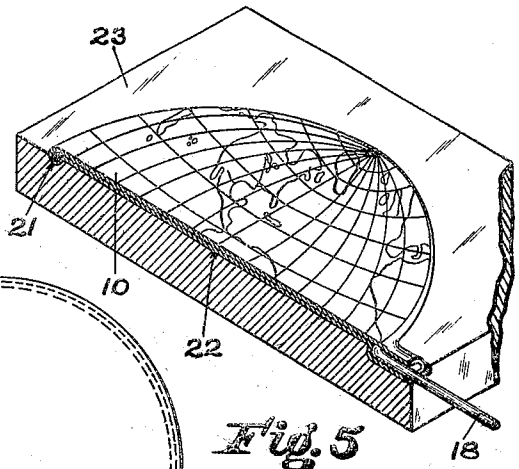


Fig. 5

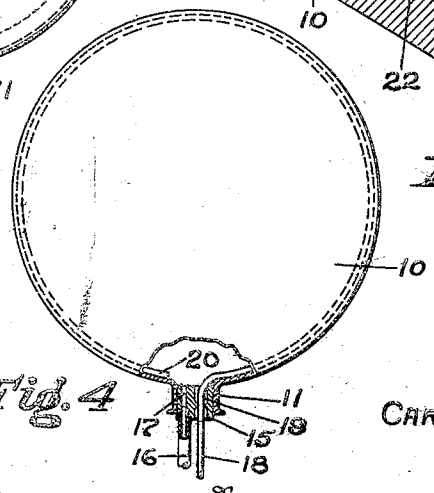


Fig. 4

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UNITED STATES PATENT OFFICE

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PROCESS OF PRINTING ON INFLATABLE ARTICLES

Application filed December 29, 1930. Serial No. 505,300.

This invention relates to improvements in the process of printing on inflatable articles, such as balloons and the like.

Heretofore various attempts have been made to print on the surfaces of inflatable articles, such as balloons. Balloons have been printed while inflated, but such method is impracticable since the slippage of the rubber on the printing blocks during printing smudges the ink and produces irregular, distorted figures or designs on the surface of the balloon. Such articles have also been printed with words, pictures, designs or figures when deflated. The images printed by latter method become materially distorted when inflated, and the image separates into indefinitely small portions, and thereby detracts from its appearance. Neither of these methods as above mentioned are practicable, if it is desired to imprint a design extending over a considerable area of the inflatable surface.

It is the primary object of this invention to overcome these previous difficulties and to provide a process of printing on inflatable articles while in a stretched and flat condition, so that it is possible to print a design extending over any portion or practically the entire surface of the articles.

Other objects will be apparent from the following disclosure. One embodiment of this process has been illustrated in the accompanying drawing, in which like reference numerals indicate like parts.

Fig. 1 is a plan view of the form indicating a balloon in position, ready to be inflated;

Fig. 2 is another plan view showing the balloon partially inflated, and partially slipped over the form;

Fig. 3 is a further plan view showing the balloon inflated and the form slipped entirely therein;

Fig. 4 is a plan view of a modified apparatus; and

Fig. 5 is a fragmentary perspective view showing the manner of support during printing.

This improved process of printing on inflatable articles, such as balloons, in its broadest aspect consists of inserting a form, having a predetermined shape and size, inside of the balloon to stretch and hold its surface for printing, and then printing on the surfaces of the article. The form may be of a rigid, or a collapsible construction, and may be made of any suitable material.

As illustrated in the drawing, an inflatable article, such as a balloon 10 is first stretched so that it forms a flat object having a perimeter of the same shape and approximating the size of a great circle of the inflated article. This may be accomplished by inflating the balloon and inserting a form 12, of the predetermined shape and size, therein during inflation. The neck of the balloon 10 is placed over the open end of the tubular form 12. The form is connected to a valve 13 which controls the passage of air under pressure from any suitable source. The neck 11 is held tightly around the form when air under pressure is admitted through the tubular form to inflate the balloon. As the balloon inflates, the neck is moved around the form as indicated in Fig. 2. The inflation of the balloon 10 and the movement of the neck 11 around the form 12 continues until the form is entirely within the balloon. The air pressure is then shut off, and the neck 11 released so that air within the balloon may escape. When the balloon is entirely deflated, the balloon fits tightly over the form and provides two flat surfaces which may be readily printed upon by any well known printing apparatus.

If desirable, the balloon may first be inflated, and then the form inserted while the balloon is wholly inflated, or as it starts deflating in size.

A modified apparatus is illustrated in Fig. 4 in which a stopper 15 is placed in the neck 11 of the balloon 12. An air pipe 16 is connected with the hole 17 in the stopper to admit air under pressure to inflate the balloon. The end 20 of a wire form 18 is then passed through a hole 19 in the stopper 15. As the balloon is inflated, the stopper 15 and neck 11 are moved around the wire form, in a manner similar to that shown in Figs. 1 and 2, until the entire form is inside the balloon. The balloon is then deflated so that it stretches tightly and flatly over the wire

form. By utilizing a wire form, a thinner flat object may be obtained for printing.

The printing may then be accomplished on any well known printing apparatus. In the preferred manner, however, a platen 23 is provided for the printing press, having a groove 21 of a size and shape so that the form 12 or 18 will fit therein. The center portion 22 of the platen forms a flat backing surface for the balloon during printing. The impression may then be made by any printing type or cuts to produce the desired impression or design on the balloon. As illustrated in Fig. 5, a portion of the globe, the Western Hemisphere, has been impressed thereon. The balloon may then be turned over and the Eastern Hemisphere printed on the other side, thus forming a substantially continuous design around the surface of the balloon. It will be readily appreciated from the above disclosure that any words, characters, or designs can be imprinted on the surface of a balloon without the danger of smudging the ink. Due to the fact that the printing is done while the balloon is stretched, the distortion of the image when inflated will be minimized.

The term "great circle" as used in the foregoing shall be interpreted as meaning a perimeter of the inflated balloon on a plane passing therethrough and containing the axis of the balloon.

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

1. The process of printing on inflatable articles consisting in stretching the article to a flat form of a shape and size approximating a great circle of the article when inflated, then printing thereon in a stretched flat condition.

2. The process of printing on inflatable articles, consisting in inflating the article and inserting a form therein having a shape and size approximating a great circle of the article when inflated, then deflating the article so that it is stretched firmly and flatly over said form, and then printing thereon while in a stretched but flat condition.

Signed at Westboro, Massachusetts, this 24th day of December, 1930.

CARL C. SPRAGUE.