May 13, 1969 J. R. EHRLICH 3,443,337

TOY FOR BLOWING BUBBLES

Filed Aug. 24, 1967 Sheet 1 of 2

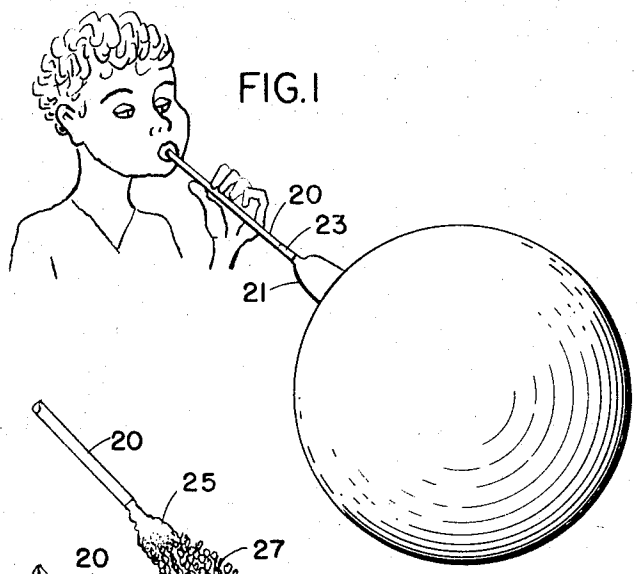


FIG.1

FIG.7

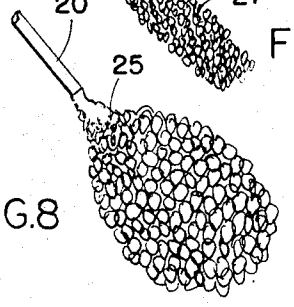


FIG.8

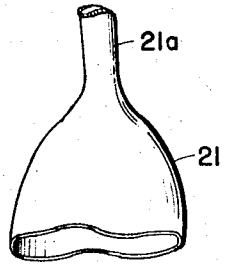


FIG.2

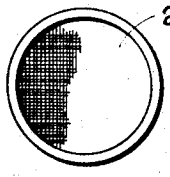


FIG.9

FIG.3

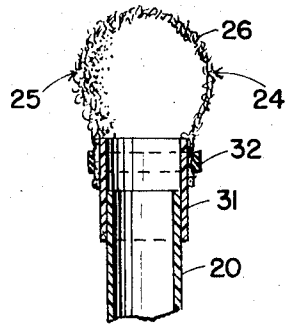
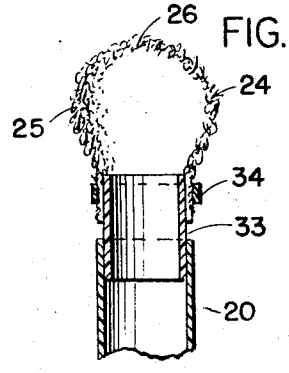


FIG.4



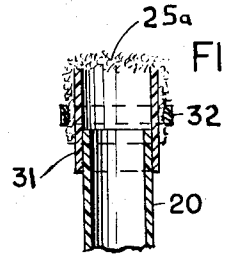
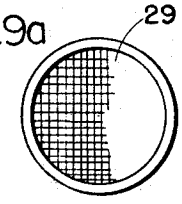


FIG.5

FIG.9a



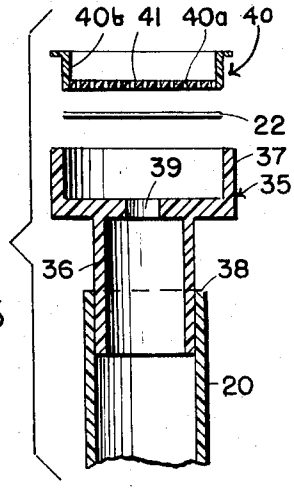
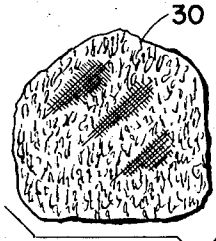


FIG.6



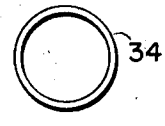


FIG.10

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FIG.12

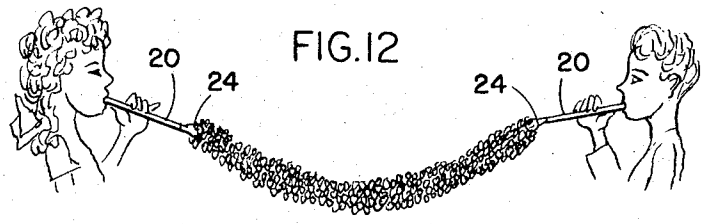


FIG.13

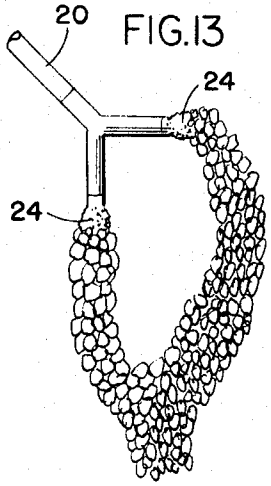
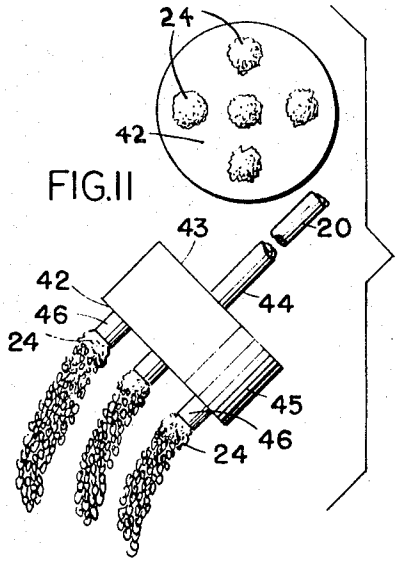


FIG.11



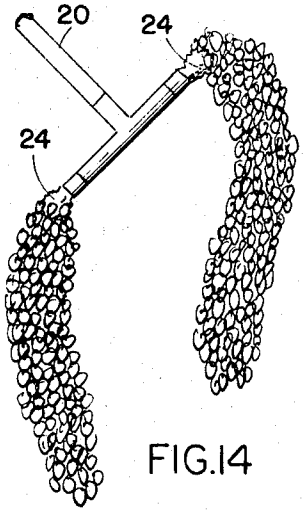


FIG.14

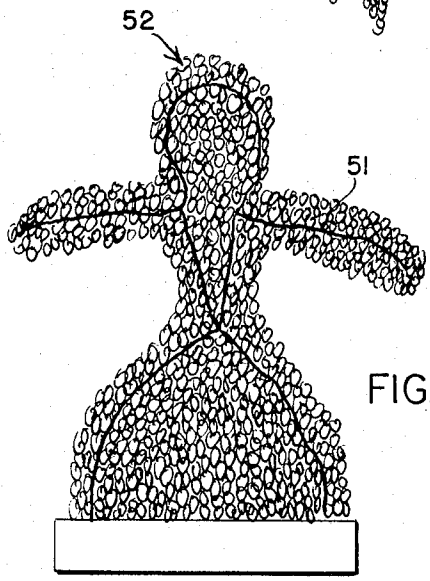
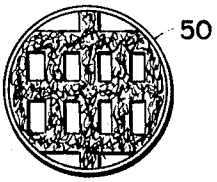


FIG.15

FIG.16



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TOY FOR BLOWING BUBBLES

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Int. Cl. A63l 33/28
U.S. Cl. 46—6 5 Claims

ABSTRACT OF THE DISCLOSURE

A child's toy bubble pipe is provided which has a tube for blowing air by mouth to a loosely stretched membrane for containing a charge of fluid within its minute interstices. The membrane inhibits distasteful back-flow of fluid to the child's mouth and on flexing, due to fluctuations of air flow, continually produces bubble forming films throughout its entirety which in turn enable the blowing of continuous chains of bubbles.

Bakground of the invention

This invention relates to a device for blowing so-called soap bubbles. Water solutions of soap such as solutions of the reaction products of natural fats and oils with alkalis are rarely used at present for this purpose. Instead commercial bubble solutions are used, mostly based on the surface activity of detergents and similar products. However, for simplicity all bubbles in this specification, regardless of what bubble-forming material they are made, shall be called "soap" bubbles.

Hereofore it has been known that soap bubbles of all sizes within reasonable limits can be produced, mostly for the enjoyment of children or for stage effects, by first forming a plain film of soap solution spanning the gap formed by the edge of the open end of a tube or by a ring or any noncircular shape as produced by a metal wire or any other wire-shaped material, or by the edges of an opening or hole punched into a flat piece of sheeting, and producing a slight air movement directed toward the soap film, which will detach the film from its support whereby the film immediately assumes the shape of a sphere filled with air and which is generally called a bubble. These bubbles may be carried by air and appear to be flying until they break.

The air movement can be produced by gentle blowing against the soap solution film or by moving the device rapidly with the film, thereby creating the necessary air movement. It has also been known to produce foam by pressing air or any other gas into a soap solution.

Summary of the invention

A toy for blowing a variety of differently shaped soap bubble formations such as continuous bubble chains, garlands, foam sculptures, clusters of middle-sized bubbles, individual giant bubbles, etc., comprising a tubular member with an exchangeable head, end-piece or adapter or other bubble forming device, which is detachably air-tight-fastened to one open end of said tubular member. The bubble forming device may consist of a funnel-shaped piece made of highly flexible, soft plastic or rubber, a small pouch made of laced, napped, looped or

knitted fabric, plastic grillage, metal neting, coarsely or finely woven or nonwoven fabric and similarly patterned closures or other fibrous material. Such end-piece may have a built-in valve or an air-flow dampening device. The head or bubble forming device may be permanently attached, or detachable from the tubular member so that it may be exchangeable.

By dipping the end-piece into a bubble solution and blowing gently into the mouth end of the tube after having withdrawn it from the solution, bubbles in various shapes and sequences can be formed, depending on the the individual end-piece used. Such bubble formations can be made by one or several individuals who may join together their respective bubble formations.

In a principal aspect of the invention a tubular member, preferably a straight or elongated plastic tube, with an inner diameter of approximately ½ inch and a length of approximately 7 inches is used to which an exchangeable head, end-piece or other bubble forming device is attached by means of a tightly fitting ring which may be of elastic or nonelastic or nonelastic material, and which is slipped together with bubble forming device over the tube, so as to connect the end-piece with the tubular member in an air-tight manner.

It is an object of the invention to produce special-sized bubbles or special-sized bubble formations by blowing gently into the tube. By changing the interchangeable end-pieces or adapters various types of bubble formations can be produced, depending on the nature of the adapter.

It is another object of the invention to produce long chains and garlands consisting of interconnected bubbles which emerge from the end-piece and which are directionally oriented in string-like fashion. Such chains and garlands may reach considerable length such as from 2 to 10 feet, depending on the quality of the bubble solution, the bubble size, the skill of the operator and other factors as hereinafter will be explained (for example FIGS. 11–14).

The size of such bubbles in a chain may vary between ¼ of an inch to 2 inches or more, but the preferred size are chains consisting of bubbles with ½ to 1 inch diameter. Such chains have a considerable life and may prevail for many minutes up to half an hour or even an hour without breaking or disappearing. They can be scooped up by hand and be carried. If two persons are blowing chains or garlands from similar devices they may start standing close together, so that the chains emerging from each bubble forming device or adapter touch each other. The persons, each by steadily regressing and constantly blowing into the tubular member, can extend such garlands over a distance as much as 8 to 10 feet or more. More than two persons, for instance four, five or six, may start blowing in a similar way, starting from a center point and regressing in different directions, and can form giant star-like patterns of garlands. Then length of such chains or garlands is only limited by their final weight which might finally cause a chain to break at one point, but without destroying the chain itself (for example FIG. 12).

Such chains or garlands are being best produced by a bubble forming device or an adapter consisting of a relatively small pouch which can be slipped over the tube and which may consist of a napped cloth or a cloth with cut or uncut loops such as material known

as terry cloth, the type which is being used in bath towels. Such pouches absorb a relatively large amount of soap solution to provide enough material for long chains. By gently pressing air through the tube or tubular member, bubbles form through the pores, pile or loops of the pouch and stream forward in one continuous narrow stream as long as enough pressure is sustained (for example FIGS. 3, 4, 12, 13, 14).

By using either double layers of terry cloth or one layer of tighter woven cloth or by using cloth with loops on one side only or loosely woven cloth, garlands of smaller or larger diameter can be made. The small-diameter garlands have an average of about one inch and are composed of smaller bubbles which are produced by tighter woven fabrics or double layers of fabric. It is advantageous or preferable to use a small pouch rather than a tightly stretched fabric as the bubble forming end-piece or head connected to the tubular member because a tightly stretched fabric will give similar bubble chains, though slightly smaller in diameter, but does not hold as much liquid as a pouch and therefore holds less supply for production of long chains. An increased liquid supply can, however, be provided for by putting a small piece of surgical cotton, which will hold additional liquid, behind the air-flow dampening fabric. Another difference between a stretched fabric and a pouch at the end of the tube is that the increased surface of the pouch provides for garlands with larger diameter. However, it is to be understood that the invention embraces the use of tight fabric (for example FIG. 5).

The bubbles emerging from such laced, napped or looped bubble forming devices are directly interconnected, continuous and directionally oriented, substantially in one direction. These string-like oriented formations are especially pronounced when the bubble forming device comprises terry cloth, preferably in the form of a pouch. Instead of using tightly woven, napped or looped fabrics it is possible to use other knitted or netted or laced material such as plastic or metal netting. Fiberglas, etc. Other formations such as grape-like clusters, spirals, etc. can be produced depending on the pattern and nature of the bubble forming end-piece and eventually on the method of blowing. For instance, by blowing a garland and simultaneously turning the pipe or tubular member in a circular way, the garland tends to form a spiral; as another example, by rotating the same while blowing one can wind the bubble string into a ball.

Instead of using one pouch as a bubble forming adapter one can use a multiple pouch adapter (for example, FIGS. 11, 13, 14). By using a T-shaped piece with a center-opening fastened to the pipe, two pouches, one on each side of the T in horizontal position, will produce two separate chains, moving downwards by gravity. Using a Y-shaped piece in a similar way, the two chains which will emerge might gradually join to form one garland with a diameter twice as big.

Likewise a plurality of parallel chains can be produced by using a bubble forming adapter which is in the shape of a drum (for example FIG. 11). Other forms of chains are possible.

Individual giant bubbles also may be formed (for example FIG. 1).

Various further and more specific purposes, features and advantages will clearly appear from the detailed description given below taken in connection with the accompanying drawings which form part of this specification and illustrate merely by way of examples of embodiments of the device of the invention.

Brief description of the drawings

In the following description and in the claims, parts will be identified by specific names for convenience, but such names are intended to be as generic in their application to similar parts as the art will permit. Like reference characters denote like parts in the several figures of the drawing, in which:

FIG. 1 illustrates an embodiment of the invention in use;

FIG. 2 is a view of the device according to the invention in the form seen in FIG. 1;

FIGS. 3, 4, 5 and 6 depict further embodiments of the invention also showing some types of materials for use as flexible members for the bubble blowing device;

FIGS. 7 and 8 show applications of the embodiments illustrated in FIGS. 3 and 4;

FIGS. 9, 9*a*, 10, 16 depict other examples of materials for use in connection with the bubble blowing device;

FIG. 11 shows a further embodiment of device according to the invention; and

FIGS. 12, 13, 14 and 15 illustrate additional types and uses of devices made in accordance with the invention.

The device according to the invention comprises essentially a tubular member **20**, preferably elongated, made of any suitable material preferably plastic, to which is connected a bubble forming device which may be either permanently attached to tubular member **20** or varieties of which may be in the form of exchangeable end-pieces, heads or adapters, several of which examples are depicted in the drawings.

FIGS. 1 and 2 depict a type of bubble forming flexible member **21**, to produce individual large bubbles which, on the average, may have a diameter of 10 to 14 inches or even a greater diameter. Flexible member or end-piece **21** may be exchangeable or permanently connected to tubular member **20**. Such bubble forming member or end-piece **21** consists of a funnel-shaped, highly flexible or even drapable material. Such material can be thin polymeric material such as rubber or plastic, for instance of the kind being used for inflatable balloons or thin plastic such as polyethylene or vinyl polymer, etc. Such funnel-shaped end-pieces can normally fold up and be in a collapsed position while, when fully spread out, the widest diameter of the funnel might be from 1½ up to 2, 3 or even more inches. The advantage of the extreme flexibility of funnel-shaped end-piece **21** is that, while the bubble is being formed, it is frequently moving because of air currents to a point where the bubble may break away. The highly flexible funnel end can move along with such air fluctuations and can easily adapt itself to the continuously changing shape of the bubble. Thus it is possible to blow bubbles with a diameter as big as two feet or more. It takes several minutes to blow such a large bubble with a gentle air stream from a relatively narrow tube **20**. If such a funnel were of rigid nature, the bubble would break long before it can reach that size.

A bubble of a diameter of two feet has a volume of about 30 gallons of air. To blow a bubble of that size by mouth is not quite easy. To facilitate the blowing of such big bubbles one can use wider tubes for blowing, or one can connect such tubes with a hair dryer or the exhaust of a vacuum cleaner or a similar mechanical blower.

To control and slow down the flow of air it is preferable to place at the end of the tubular member or blowing pipe **20** an airflow dampening device such as a valve or a piece of narrow woven fabric. By slowing down the flow of air the chances of blowing bigger bubbles are considerably better. A fast stream of air causes the formation of elongated bubbles which are harder to control. A slowed-down stream of air makes a bubble in the form of a sphere which gradually grows and continuously maintains a substantially spherical shape. A piece of fabric stretched over and covering the end opening of the tube and held down with a retainer **23**, for example, a rubber or other elastic band or ring, can provide a satisfactory dampening effect. Such a fabric should have from about 28 to 42 interstices to the linear centimeter. It could be a

fabric which has for instance about 29 and 41 threads of wrap and filling, respectively. Once the dampener is fastened to the front end of tubular member **20**, the neck **21***a* of the funnel-shaped adapter **21** is slipped over such end.

Another advantage of using a thin highly flexible material as the bubble forming member or adapter **21** for blowing large bubbles, is that when funnel-shaped it can be manipulated to be dipped into a container of bubble solution, the opening of which container might have a smaller diameter than the diameter of the forward portion of the funnel. The folded funnel might be narrowed down to have an opening which even might be as narrow as a slot. The initial soap film forms quicker and more easily by spanning a smaller opening than a larger one, yet, when the funnel is withdrawn from the liquid and the bubble is blown, the funnel opens to its full diameter and delievers a full-sized bubble.

Another advantage of the highly flexible bubble forming adapter **21** is that, when blowing large bubbles, it is possible to squeeze with the fingers and lock the neck **21***a* of the funnel in order to prevent the air from flowing out of the bubble. This happens when it is necessary to interrupt the blowing in order to take a new breath as is repeatedly necessary for continuous blowing of large bubbles.

FIGURES 3 and 4 depict a bubble forming device for forming chains or garlands of bubbles, having relatively small pouch **24** which device can be either permanently or as an adapter or exchangeable head, connected to tubular member **20**. The bubble forming flexible member **25** may comprise a knitted or napped fabric or cloth, or a fabric or cloth with cut or uncut loops **26**. Such pouches absorb a relatively large amount of bubble forming aqueous solution to provide enough material for long chains (FIGS. 12, 13, 14). By pressing air through the tube or tubular member **20**, bubbles **27** form through the pores, pile, nap or loops of the fabric and stream forward in one continuous stream. Other materials described herein (summary of the invention), may be used for the bubble forming flexible member. Some of these materials are shown in FIGS. 9, 9*a*, 10 and 15; FIG. 9, showing a fine mesh **28**, FIG. 9*a* showing a coarser mesh **29**, FIG. 10 showing a cut or uncut looped material **30** with retainer **34** and FIG. 16 showing lace or lattice material **50**.

As heretofore stated the bubble forming device may be permanently attached or connected to tubular member **20** or may be in the form of an exchangeable head or adapter detachably connected to tubular member **20**, so that different forms of bubble blowing devices may be used. In the bubble blowing device **24** depicted in FIG. 3, the bubble blowing flexible member **23** through which bubble forming aqueous solution is to be exuded, is secured to a ferrule or sleeve **31** adapted to snugly fit over the outer wall of the tubular member **20**, the flexible member **25** being secured to sleeve **31** by a suitable retaining ring **32**. In FIG. 4 the bubble blowing member **25** is secured to a ferrule or sleeve **33** adapted to snugly fit the inside wall of tubular member **20**, the flexible member **25** being secured to sleeve **33** by a suitable retaining ring **34**. In FIG. 5, the bubble blowing flexible member **25***a* is made taut over sleeve **31**, the former being maintained such against the latter by ring **32**.

In the foregoing examples, the bubble forming flexible member and the tubular member or blowing pipe to which it is connected are made of different materials.

It may be readily seen that the bubble forming device may be sold completely assembled or as a "knocked down" or "do-it-yourself kit."

In FIG. 6 there is depicted a bubble blowing adapter comprising a member **35** having a tubular shank **36** portion tightly fitting within tubular member or blow pipe **20** and an enlarged cupshaped head **37** against which the open end **38** of tubular member **20** abuts. Head **37** has a central opening **39**. Within and resting on the bottom of head **37** may be positioned the membrane or dampener **22** made of plastic, fabric or any suitable material, for a purpose hereinbefore stated in relation to the dampening device which has been described with reference to FIG. 1. Fitting at the top of cup **37** and extending therewithin, for example in the shape of a smaller cup, is the bubble blowing member **40**, at least the frame **40***b* of which is preferably substantially rigid in relation to the bubble blowing flexible members heretofore described. It may be made of plastic or any other suitable material. Member **40** is provided with a bottom portion or part **41** having a plurality of openings **40***a* and may form a grid through which the bubble forming aqueous solution is exuded. Bottom **41** may be made integral with and of the same material as frame **40***b* or may be made of any suitable material.

According to FIG. 11, there is shown a bubble forming device in substantially the shape of a small drum or cylinder generally indicated by the numeral **45**. Drum or cylinder **45**, about 2 to 2½ inches in diameter has a flat top **42** and a flat bottom **43**. From the bottom **43** protrudes an adapter tube **44** about one inch long; one end of tube **44** either fits tightly within the front end of tubular member **20** or is slipped tightly thereover, the other end of tube **44** leading into the drum portion **45**. From top **42** protrude a plurality of open tubes **46**, each about 1½ inches long, leading from the inside cylinder or drum portion **45** to the open air. Each one of these protruding tubes **46**, in turn, is then closed by a little pouch **24** as previously described. By blowing into the blowing pipe or tubular member **20** a plurality of bubble streams will emerge, which may stay separate (FIG. 11) or may unite to form one large garland, depending on the diameter of the individual pouches and the distance at which they are arranged from each other.

By using a bubble forming flexible member or an adapter with a tightly woven, looped pouch, bubble chains can be blown against a shaped wire or a branched piece of wood or other frame which may serve as a skeleton or support for the bubble chains. Depending on the shape of such support, forms can be produced with foam bubbles simulating sculptures similar in appearance to, for example, snow sculptures.

In FIG. 15, there is shown a skeleton **51** made of any suitable material. By means of a bubble forming device heretofore described, particular one wherein the bubble forming member has small interstices, bubbles are blown gently on form or skeleton **51** by air pressure to form a sculpture generally indicated by the numeral **52**. The foam or bubbles thus supported may last several hours and may change to a cobweb-like texture. It can be seen that very interesting sculpture forms may be produced by selecting the desired skeleton.

I claim:

1. A toy bubble pipe adapted to be held in the user's hands for blowing long directionally oriented interconnected bubble chains, comprising a tubular member having a passageway, one end of said passageway comprising a mouthpiece into which a user blows air by mouth, a bubble-forming membrane connected to the tubular member at the other end of said passageway and communicating therewith to receive air flowing through the passageway from the user's mouth, said membrane being of flexible material and entirely covering and loosely stretched across said other end of said passageway, said membrane having a multiplicity of substantially minute interstices and a multiplicity of flexible liquid film holding elements for holding a bubble making solution preparatory to the solution being released from said elements and for facilitating the maintenance of liquid films whereby a long continuous chain of directionally oriented interconnected bubbles is produced when the user blows air through said passageway with the chain being free of the pipe except at said membrane.

2. A toy bubble pipe according to claim 1 wherein said membrane is looped material.

3. A toy bubble pipe according to claim 1 wherein said membrane is a cut looped material.

4. A toy bubble pipe according to claim 1 wherein said membrane comprises a fabric.

5. A toy bubble pipe according to claim 1 wherein said bubble-forming device has at least one opening therein larger than said passageway through which air blown into said passageway may be expelled and said membrane is loosely stretched across said opening.

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