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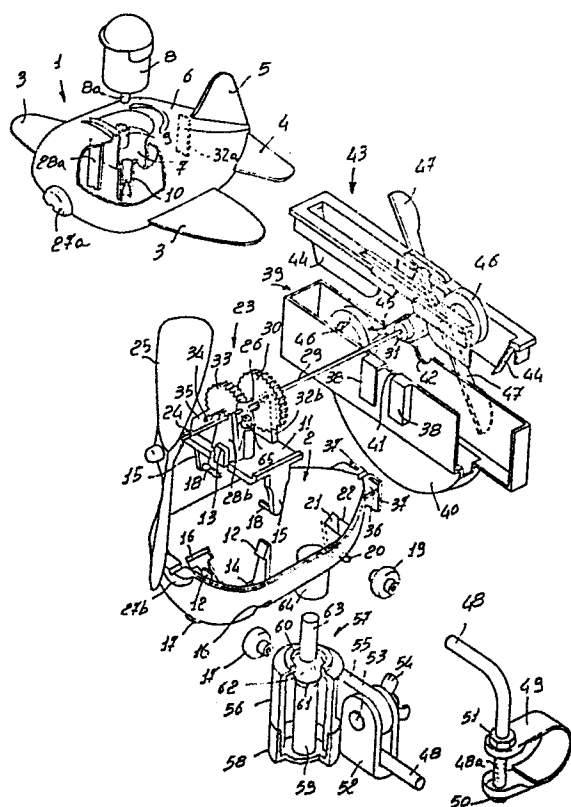
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⑤④ Toy airplane emitting bubbles of the type of soap bubbles.

⑤⑦ This toy airplane comprises a shaped body (1,2), means (48) adapted to lock the latter to a vehicle such as a bicycle, an airscrew (25) mounted rotatably on the front of the body (1,2), a pan (39) defined rearwardly and transversely to the body (1,2) and intended for containing the bubble forming liquid, arm members (45) carrying at the periphery thereof rings (46) adapted for retaining the bubble forming liquid and carried rotatably at the top of the pan (39) and transversely to the body (1,2), and a kinematic linkage interposed between the airscrew (25) and arm members (45).



"TOY AIRPLANE EMITTING BUBBLES OF THE TYPE OF SOAP BUBBLES" 0004532

This invention relates to a toy airplane for emitting bubbles of the type of soap bubbles.

It is known that playing with soap bubbles is still a widespread recreation, for the emission of such bubbles blow rings being usually utilized which, when dipped into a special liquid, are effective to retain said liquid; the user, by blowing from his/her mouth onto the ring, causes one or more bubbles to issue therefrom. Such blow rings, which require direct operation by the user, can only afford, however, limited playing potential to children, to whom they are specially directed, thereby there is a need for association of bubble emitting with new forms of play.

Thus, the task of this invention is to provide a toy airplane, whereby bubbles of the type of soap bubbles can be emitted in a substantially continuous fashion and without requiring direct operation by the user.

Within that task it is an object of the invention to provide a toy airplane which is of simple design, easy and safe to use, and of relatively low cost.

According to one aspect of the invention the above task and object are achieved by a toy airplane for emitting bubbles of the type of soap bubbles, characterized in that it comprises a shaped body, means adapted to secure the latter to a vehicle, an airscrew mounted rotatable on said body, a pan rigid with said body and intended to contain a bubble forming liquid therein, arm members carrying peripheral rings adapted to retain said liquid and being supported rotatably near said pan so as to cause said rings to be alterna-

tely dipped in the pan liquid and be raised out of said pan, and transmission means interposed between said airscrew and arm members such that the latter are effective to be rotated by the former.

5 The invention details will be more clearly understood from the following description of a preferred embodiment of the toy airplane for emitting bubbles, illustrated by way of example in the accompanying drawing, the one figure whereof is an exploded
10 perspective view, partly cutaway, of the toy airplane.

 With particular reference to the drawing figure, this toy airplane comprises a correspondingly shaped body which includes an upper cup 1 and a lower cup 2. As explained hereinafter, the two cups are secured to each
15 other with their edges mutually engaged and their hollows facing each other so as to enclose a cavity on their interiors. In general, the body 1-2 follows a cylindrical pattern at the front and middle, to then taper rearwardly to define the plane tail. At the edge
20 portion, the upper cup 1 has opposed pairs of foil-like projections 3 and 4, which are practically coplanar with the plane where the edges of the two cups join together; the center projections 3 and rear ones 4 define the wings and tailplanes, respectively, of the
25 airplane. The airplane fin is instead defined by the foil-like ridge 5 which lies on a longitudinal plane to the body 1-2 and raises from the rear portion of the cup 1, correspondingly formed with a sloping flat
6.

30 At the middle, the cup 1 defines the airplane

cockpit at a recess 7, wherein a substantially cylindrical block 8 is partly accommodated; the block has formed at its bottom the peg 8a, which is intended for a pressure fit in some form of a tube 9 extending
5 upwardly from the bottom of the hollow 7; the upper portion of the block 8, with the latter so inserted, is intended to protrude from the cup 1 and represent the face of the airplane pilot. At a position remote from the tube 9, the bottom of the hollow 7 is also
10 affected by some form of a well 10, the function whereof will be explained hereinafter. A base 11 is secured within the front portion of the cup 2; to this end two hooks 12, which extend upwardly from the bottom of the cup, are adapted to snap engage elastically
15 with respective serrations 13 defined by the base and to hold the latter abutted against the cup. The hooks 12 are arranged to face each other on said longitudinal plane of the airplane and are at the edges of respective slots 14 of the bottom of the
20 cup 2; it is, in fact, contemplated that the cup 2 (like, after all, the cup 1 and base 11) be molded from a plastic material, and accordingly, the slots 14 allows that, with the same molding operation as the cup, the hooks be formed. As shown, the serrations 13 are
25 formed at the center of the sides which the base 14 presents transverse to the airplane. At the two other sides of its, the base has respective lugs 15, facing downwards. By passing through respective shaped slots 16 formed in the cup 2, the lugs 15 locate themselves
30 below the cup, so as to carry rotatably respective

wheels 17 of the airplane. The lugs 15 define, in fact, at the bottom thereof, respective pins 18, one of which faces upwards; each pin has its end enlarged and is formed with a throughgoing cutout so as to permit insertion of the wheel with a snap action and hold it in the axial direction. A further tail wheel 19 is mounted on a similar pin 20 defined by a lug 21 which the cup 2 has at the bottom from one edge of its slot 22.

The base 11 supports at the top a reduction gear which is generally indicated at 23 and is, hence, located inside the cavity enclosed between the cups 1 and 2. The input shaft 24 of the reduction gear 23 carries rigidly mounted thereon, respectively at the front end and rear one, an airscrew 25 and a pinion gear 26. The two-bladed airscrew 25 is oversize relatively to the body 1-2, with respect to which it is frontally external and rotatable. The shaft 24 is thin, being particularly formed from metal, and is longitudinal to the body 1-2; that same shaft, in the proximities of the airscrew, is passed through and engages rotatably with some form of a bushing which comprises two corresponding bosses 27a-27b formed at the front by the edge of the respective cups 1 and 2. In the proximities of the pinion gear 26, the shaft 24 is coupled rotatably in some forms of saddles which are defined at the free ends of two flanges 28a and 28b; the flange 28a extends from the cup 1 down, whereas the flange 28b extends from the front side of the base 11 up; the two flanges extend on two adjacent planes transversely to the body 1-2 of the airplane.

The bosses 27a-b and flange 28a-b form, however, shoulders for the hub of the airscrew 25 and pinion gear 26, thereby the shaft 24 is locked in the axial direction.

5 The output of the reduction gear 23 is provided by a shaft 29 which has its axis in common with the shaft 24 and is located at the rear of the latter, being also thin and made of metal. At its front end, the shaft 29 has a gear wheel 30 rigid therewith, and at
10 its rear end, which extends outside the body 1-2, it has an elongate hub 31 rigid therewith. In the proximities of the wheel 30, the shaft 29 is rotatably coupled to the free ends of two flanges 32a, 32b; similarly to the flanges 28a and 28b, the flange 32a
15 extends from the cup 1 and the flange 32b extends from the rear side of the base 11 adjacently the flange 32a. In addition to the pinion gear 26 and wheel 30, the reduction gear 23 comprises a wheel 33, which meshes with the pinion gear 26 and is made rigid with
20 a small shaft 34 extending parallel to the shafts 24 and 29, laterally below them. The shaft 34 is supported rotatably by a pair of flanges 35 which extend from the base 11 upwards, and carries a pinion gear, not shown in the drawing, rigid therewith
25 and meshing with the wheel 30. In the proximities of the hub 31, the shaft 29 is passed through and engages pivotally with some form of a bushing, which comprises two corresponding bosses formed rearwardly by the edges of the cups 1 and 2; of such bosses, the drawing
30 figure only shows that relative to the cup 2, which is

indicated at 36.

The boss 36 is terminated rearwardly of the body 1-2 by defining, in a transverse plane to the body, a pair of upturnings 37, opposite each other and facing
5 either sides of said body. Intended for insertion and engagement above the upturning pair, are a pair of small boxes 38, which open downwards and toward each other. The boxes 38 are defined at the front and center of the upper region of the front wall
10 of a small pan 39, which is attached permanently to the rear of the body 1-2 through said boxes. The pan is intended to contain the bubble forming liquid, is flattened and extends across the body 1-2, having its edge practically contained in the same plane as
15 the edge of the cup 2. The pan 39 is of parallelepipedal shape at the top, and has at the bottom a deepening and narrowing portion 40 the periphery whereof is defined by an arc of a circle centered on the axis of the hub 31. The hub is carried rotatably at the saddles
20 41 and 42, formed in the front and rear edges, respectively, of the pan 39. Intended for press-fit engagement with said edge is a frame 43 which, excepting for the areas corresponding to the hub 31 and saddles 41 and 42, defines a lip member 44; after the
25 frame has been mounted on the pan, said lip locates itself inside the latter and facing downwards, thereby between the lip and sidewalls of the pan upper portion, there is defined a substantially annular space open downwards and being adapted to prevent said liquid
30 contained in said pan from flowing out. On the midplane

of the pan 39, a dial arrangement is rigid with the
hub 31, which particularly comprises two diametrically
opposed arms 45; each arm is terminated with a
respective ring 46. In a conventional fashion not
5 shown, the surfaces the blow rings 46 are machined to
form fins defining a series of capillary channels
which are effective, after the rings have been dipped
into the bubble forming liquid, to retain said liquid.
Directly behind the pan 39, the hub 31 has a series of
10 vanes 47 rigid therewith which are angularly offset
with respect to the rings 46; in particular, the vanes
47 are two diametrically opposed vanes aligned
perpendicularly to the arms 45. The vanes are intended
to skim the rear wall of the upper portion of the pan
15 39.

The toy airplane is intended for cantilever
installation on a vehicle, such as a bicycle. The
means for securing the airplane to a vehicle include
an arm 48 formed from wire rod. A first end of the
20 arm 48 is provided with a mount, e.g. for attachment
to the handle bars of the bicycle; that end is, in
fact, bent downwards and terminated with a threaded
portion 48a, which is passed through the arms of an
elastic strap 49. The strap is arranged to surround
25 an area of the bicycle handle bars, the arm 48 being
substantially parallel to the handle bars; the strap
is then secured by acting on the nut 50, which is
threaded onto the free extremity of the portion 48a,
and thus urging the strap arms toward the shoulder
30 formed by the other nut 51, which is located at the

other extremity of the portion 48a. The other end of the arm 48 is made rigid with a yoke 52 which carries a pin 53 substantially horizontal and parallel to the strap 49. At the pin 53, angularly adjustable to the yoke 52, and hence through the wingnut 54 lockable in the desired angular position, is a flange 55, which is rigid with and substantially radial to the housing 56 of a ball joint support 57. The housing 56, which is substantially cylindrical, is closed at the bottom by a base 58 threaded to said housing; the base 58 carries at the top a stem 59 which extends axially to the housing 56 and ends below an opening 60 through the housing top. The stem 59 carries at its top end an element 61 formed from an elastic material and being configured cup-like to provide a seat for a ball 62; the ball is made rigid with the bottom extremity of a shank 63, the top end whereof protrudes out through the opening 60 and is intended for press-fit permanent engagement with a cap 64 which the cup 2 defines downwardly. By partly backing off the base 58 of the swivel support 57, by rotating the ball 62 relatively to the housing 56, the shank 63, and hence the airplane body 1-2, are caused to occupy a desired angular position with respect to the housing; this angular position is then locked by threading in the base 58 such that the stem 59 clamps the ball 62 against the edge of the opening 60.

The two cups 1 and 2 are mutually joined by means of a screw which is inserted through the well 10 at the center whereof it meets a shoulder, which is

threaded in some form of a small tube 65 extending upwards from the base 11.

The operation of the toy airplane may be readily appreciated from the foregoing description. As the
5 bicycle on which the airplane is cantilever mounted is cause to move, the airscrew 25 meets a flow of air and is rotated; owing to its size, the airscrew power is adequate to drive, by suitable reduction through the reduction gear 23, the rings 46 and vanes 47.
10 Alternately, the rings are dipped into the liquid contained in the pan 39 and raised above the latter where they are swept by the air stream, which meets favorably the sloping flattening 6. Owing to the flow of air through the rings, long bubble trains are
15 emitted. Thus, with this toy, the bubbles are formed in a substantially continuous fashion and without conventionally blowing directly by the user. The vanes 47 keep the rear surface of the pan clean, preventing such a froth build-up as could otherwise inhibit the
20 formation of the bubbles. It should be noted that the provision of the lip 44 on the pan 39 prevents the bubble generating liquid from flowing out of it even where the vehicle, owing to irregularity of its motion, subjects the toy airplane to shaking and
25 tilting or other movements.

Of course, it should be clear that the airplane parts may be made distinguishable by different colors and its body may have sticker decoration applied.

In practicing the invention, the materials used,
30 shapes and dimensions, may be any selected ones to meet individual requirements.

CLAIMS

1 1. A toy airplane for emitting bubbles of the
2 type of soap bubbles, characterized in that it com-
3 prises a shaped body (1,2), means (48) adapted to secure
4 the latter to a vehicle, an airscrew (25) mounted
5 rotatable on said body, a pan (39) rigid with said
6 body (1,2) and intended to contain a bubble forming
7 liquid therein, arm members (45) carrying peripheral
8 rings (46) adapted to retain said liquid and being
9 supported rotatably near said pan (39) so as to cause
10 said rings (46) to be alternately dipped in the pan
11 liquid and be raised out of said pan (39), and
12 transmission means interposed between said airscrew
13 (25) and arm members (45) such that the latter are
14 effective to be rotated by the former.

1 2. A toy airplane according to Claim 1, character-
2 ized in that said pan (39) has around its edge an
3 inner lip (44) facing downwards and defining, with the
4 sidewalls of said pan (39), an annular space open
5 downwardly and being effective to prevent said liquid
6 from flowing out, said lip (44) being defined by a
7 frame (43) attached to edge of the pan (39) and the
8 latter having a deepened portion concentrical to said
9 arms (45) and adapted to be intersected by said rings
10 (46) therefrom.

1 3. A toy airplane according to Claim 1, character-
2 ized in that said body (1,2) comprises a pair of cup-
3 like (1,2) elements enclosing a cavity on the interior
4 whereof and longitudinally whereto there is arranged
5 said kinematic linkage including a reduction gear (23)

6 whereby the rotational speed imparted to said arms
7 (45) is lower than that of said airscrew (25).

1 4. A toy airplane according to Claim 1, character-
2 ized in that rigid with said arms (45) are a series
3 of vanes (47), arranged behind said pan (39) and being
4 angularly offset with respect to said rings (46), which
5 vanes (47) are adapted to wipe the rear wall of said
6 pan (39).

1 5. A toy airplane according to Claim 1, character-
2 ized in that said securing means (48) comprise a shank
3 (63) extending from said body (1,2), an arm having at
4 a first end a mount for attachment to said vehicle,
5 a ball-joint support (62) interposed between said
6 shank (63) and the other end of said arm and being
7 lockable in a desired angular position.

1 6. A toy airplane for emitting bubbles of the
2 type of soap bubbles, according to the preceding
3 claims and substantially as herein described and
4 illustrated.

