

BUBBLE BLOWER

(No Solder Kit)

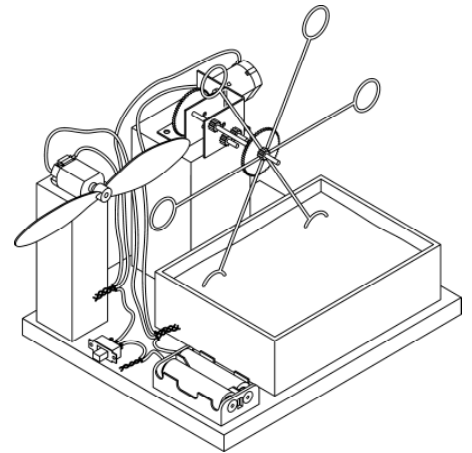
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DESCRIPTION

This device is designed to automatically blow bubbles! One motor, driving through a gearbox, constantly rotates 6 wire hoops, which continuously dip into a vessel holding the bubble mixture. The propeller (driven by a second electric motor) blows air into the hoops, producing a constant stream of bubbles.



SECTION 1: GENERAL INFORMATION

- The basic construction of the *BUBBLE BLOWER* is shown here. It is worth preparing a full size drawing to work out the actual size of the components to be made.
- The propeller drive should be mounted on a separate base from the hoop gearbox and motor. This allows experimentation to determine the best distance from the air stream to the hoops to form bubbles. The base and uprights can be made from timber. Note: the battery power to both motors is controlled by the same switch.
- A reasonably large size base can be used, as this will allow the base to carry the bubble mix vessel, and the hoop wheel. The vertical stand should be large enough for the gearbox / motor to be mounted.

Note: this kit has components that allow this to be assembled without soldering. However, the connections will be more effective and permanent if they are soldered.

SECTION 2: COMPONENTS & MATERIAL REQUIRED

2.1 COMPONENTS SUPPLIED

- | | |
|--|---------------------------------------|
| 1 x Electric Motor 3.0V (flat) – with wires | 1 x Slide switch (small - with wires) |
| 1 x Bubble Blower Gearbox / motor with wires | 1 x 60x10 Teeth Spur Gear |
| 1 x Propeller 74mm | 2 x 3x4mm wood screws |
| 1 x 2AA Battery holder | 3 x Screw-on Connectors |

2.2 ADDITIONAL MATERIALS REQUIRED

2.2.1. AA Batteries are available from us, and need to be ordered separately.

2.2.2. Material for the base and motor mounting, fine multi-strand electric wire, wire for the hoops, bubble mixture, and a vessel for the bubble mix.

SECTION 3: MAKING AND ASSEMBLING *BUBBLE BLOWER*

3.1 THE PROPELLER DRIVE:

- The propeller is pressed on to the motor's shaft and is driven by the motor.

HINT: Place the end of the shaft (where it exits the motor) on a hard surface, and push the propeller down. WARNING: Don't just push the motor down by hand as this can push the motor armature out of its bearings and jam the motor.



SCORPIO TECHNOLOGY VICTORIA PTY. LTD.

A.B.N. 34 056 661 422

17 Inverell Ave., Mt. Waverley, Vic. 3149

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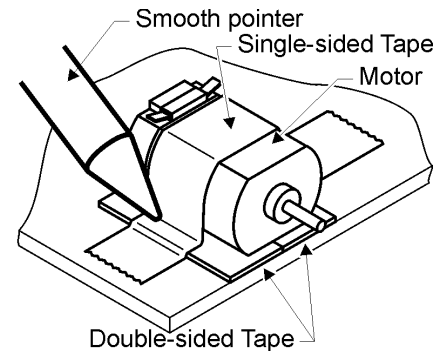
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Attach the motor to its upright / mount (hot glue or double sided tape work well).

- Place the upright onto the base, but do not assemble the upright to the base just yet.

3.2 GENERAL:

- Determine a suitable location for the battery holder and glue it into the base (if using hot glue, roughen the surface to be glued with sandpaper to improve adhesion).
- Attach the switch to the base using double sided foam tape or hot glue.



WARNING: if using Hot glue, be very careful, as it can burn you, if you get it on yourself.

- Attach the gearbox using the 2 wood screws, using 2 of the diagonally opposite holes in the base.

3.3 THE HOOP WHEEL & BUBBLE MIX:

- Form the 6 wire hoops and glue them on to the white 60T gear at equal intervals.
- Press-fit the hoop and gear assembly onto the motor and gearbox's output shaft.
- Attach the gearbox / motor onto the upright using the screws provided.
- Attach the upright to the base

3.4 THE BUBBLE MIXTURE CONTAINER:

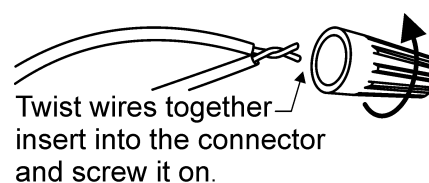
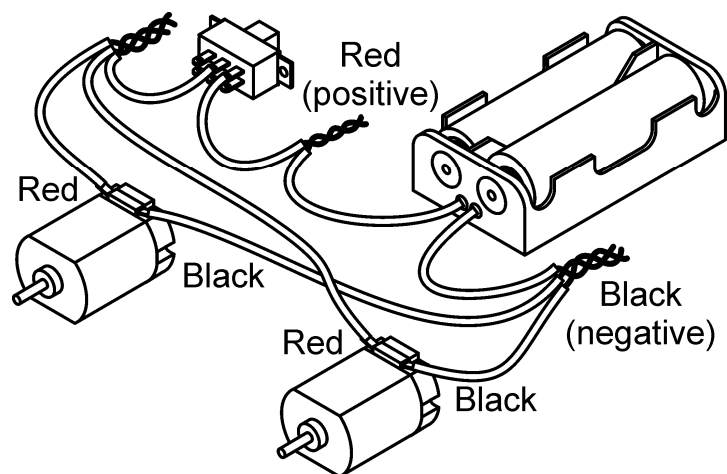
- The container must be leakproof and MUST be deep enough for the hoops to be totally submerged beneath the surface of the bubble mixture.

SECTION 4: WIRING UP THE *BUBBLE BLOWER*

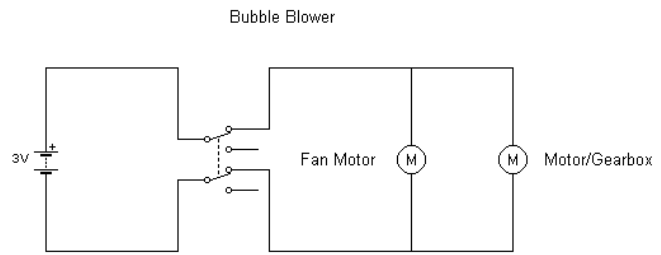
The battery holder, on-off (sliding) switch, small electric motor (for the propeller) and the hoop wheel's Gearbox / motor should be connected as shown in the wiring diagram.

- Connect the battery holder's red wire to the red wire on the switch's end terminal. Twist the ends together, and finish by screwing on the screw-on connector
- Connect the switch's middle terminal to red wires from both the propeller drive motor and the gearbox / motor. Twist them together and attach a screw-on connector.
- Connect the black wires from the battery holder, propeller drive motor and the gearbox / motor by twisting them together.

Note: Leave the wires long enough to move the bases around.



- Check that both the bubble hoop wheel and the propeller rotate in the correct directions, to have the propeller blowing forward, and the hoops coming out of the mix, into the stream of air. If not, reverse the wires of the motor that you want to reverse.
- When both motors rotate in the correct directions, attach the last screw-on connector.



CIRCUIT DIAGRAM

SECTION 4: TESTING IT

Once you've made the Bubble Blower, and checked that the bubble hoop wheel and the propeller rotate in the correct direction:

- experiment to determine the best distance between the hoops and the propeller, for blowing bubbles. This is done by moving the propeller drive's upright relative to the hoops.
- attach the propeller drive's upright onto the base.

SECTION 5: BUBBLE MIXTURE

The following recipes are both formulas for home made bubble mixture.

MIXTURE 1: 1 cup water, 2 tablespoons liquid detergent, 1 tablespoon glycerine, ½ teaspoon sugar.

MIXTURE 2: 1 litre water, 8 tablespoons diswashing detergent, 6-8 tablespoons glycerine.

NOTE: Morning Fresh detergent gives good results

In locations where the water is "hard" then distilled water should be used.

SECTION 6: FURTHER / EXTENSION WORK

Now you've made *BUBBLE BLOWER*, there are other ideas you can try. Some of them are:

- Make the hoops different shapes.
- Make different sized hoops to compare which size is the most effective.
- Try adding partitions in the hoops to see if smaller sized bubbles are created. Drinking straws cut into short lengths should work. Join corners together by connecting with small paper clips in the corners. (Join 3 paper clips together. Slip inside the straws).
- Drinking straws taped together make a cluster of bubbles. Try with the *BUBBLE BLOWER* and by blowing.
- Try using different bubble mixtures to judge which is the best. Compare commercially available mixtures to home made mixtures (two samples are listed below).
- Compare the *BUBBLE BLOWER* to blowing bubbles yourself. Which is more effective?
- Try making a geometric bubble. Make a cube or pyramid with straws. Geometric bubbles aren't blown. The soap film fills the sides of the frame to create the shape. Dip sides into the soap solution until all sides are filled.