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**Martin**

(54) **APPARATUS FOR LAUNCHING AND INDICATING SPEED OF PROJECTILES IMPELLED BY THE FORCE OF BREATH**

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| ***A61B 5/00*** | (2006.01) |

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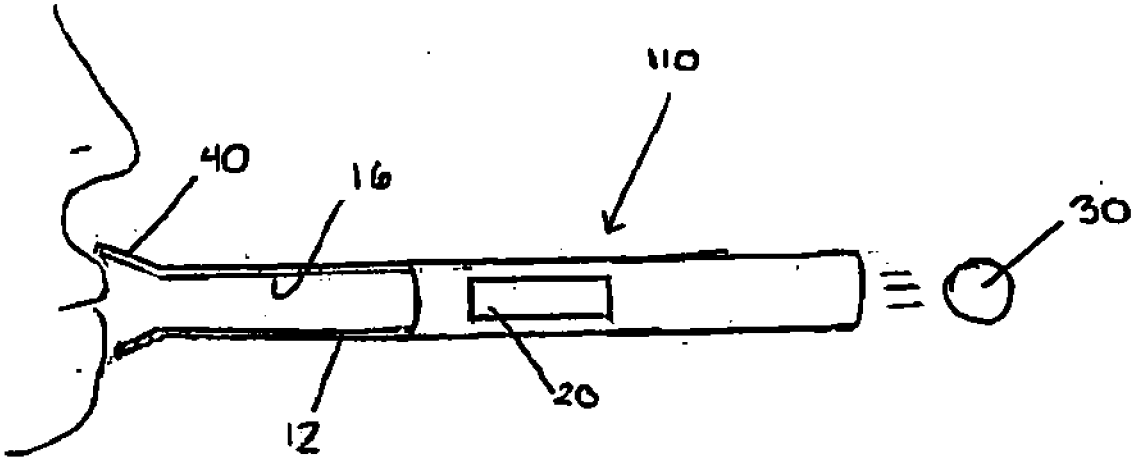
(57) **ABSTRACT**

A combined blow gun and projectile wherein the blowgun includes an elongated tubular component, a mouth piece, at least one sensor, and a visual indicator for projectile speed. The kit is simple and provides a method of qualitatively evaluating breath force whether for sport or for medical purposes.



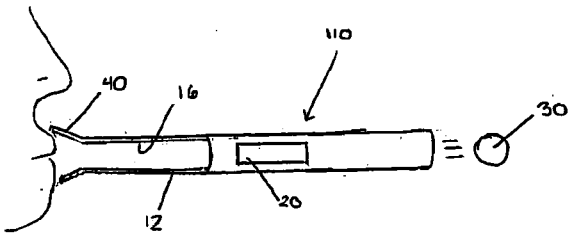



FIG. 1

FIG. 2

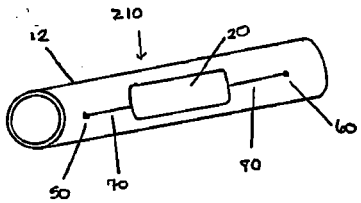



FIG. 3

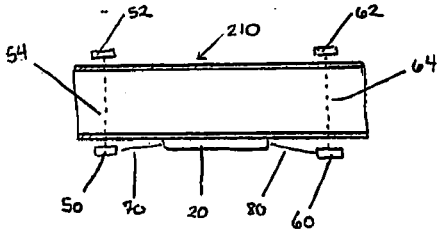



FIG. 4

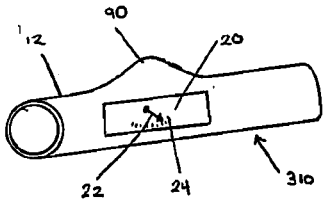



FIG. 5

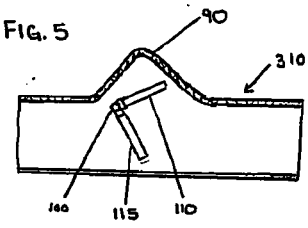



FIG. 6

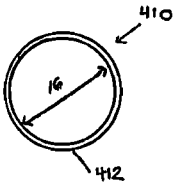



FIG. 7

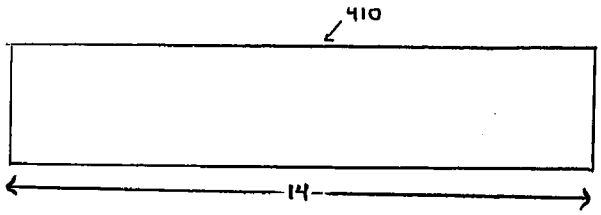


FIG. 8

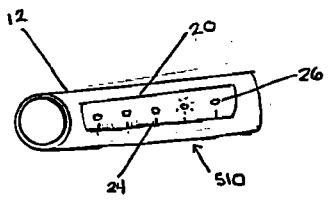



FIG. 9

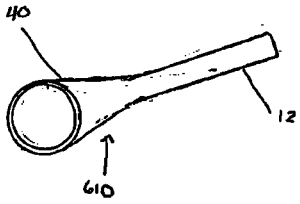



FIG. 10

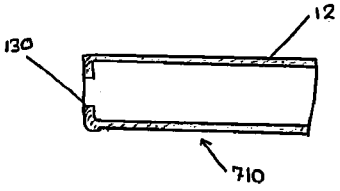



FIG. 11

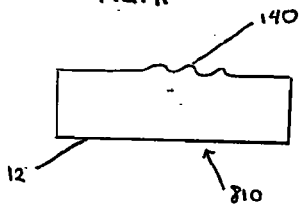
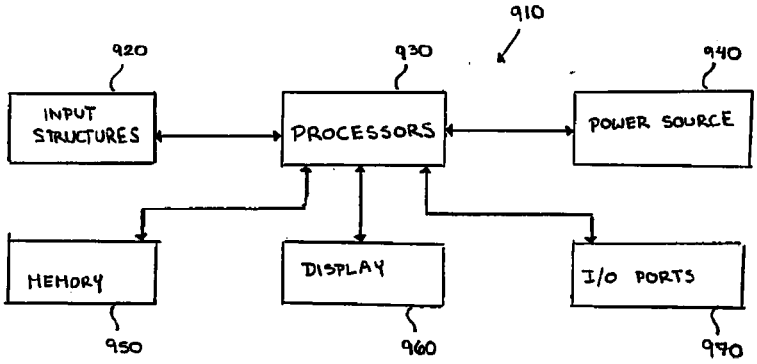



FIG. 12



# APPARATUS FOR LAUNCHING AND INDICATING SPEED OF PROJECTILES IMPELLED BY THE FORCE OF BREATH

## BACKGROUND

**[0001]** This disclosure relates generally to toys for children and more particularly to blowguns and peak flow meters.

**[0002]** A projectile, a small spherical object, is loaded into one end of a blowgun or peashooter and blown forcefully through by the user. This is a competitive sport especially for children and it would be useful to develop an improved version of the device.

## SUMMARY

**[0003]** One embodiment is an apparatus comprising an elongated tubular component, a mouth piece connected to the tubular component for application of air pressure, a generally spherical projectile concentric to the tubular component, at least one sensor attached to the tubular component, and a visual indicator connected to the sensor(s) providing a visual indication of speed of the projectile travelling through the tubular component.

**[0004]** Another embodiment is a method comprising obtaining an apparatus comprising an elongated tubular component, a mouth piece, a generally spherical projectile, and a velocity sensor configured to sense the velocity of the projectile traveling through the tubular component. The method also includes blowing through and ejecting the projectile and reading the projectile velocity output on a display.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0005]** FIG. **1** is a side view of a first embodiment of the present invention;

**[0006]** FIG. **2** is a perspective view of an apparatus with a form of indicators;

**[0007]** FIG. **3** is a cutaway view along the length of the apparatus depicted in FIG. **2**;

**[0008]** FIG. **4** is a perspective view of a second embodiment of an indicator;

**[0009]** FIG. **5** is a cutaway view along the length of the apparatus depicted in FIG. **4**;

**[0010]** FIG. **6** is a front view of a generic schematic version of the apparatus;

**[0011]** FIG. **7** is a side view of a generic schematic version of the apparatus;

**[0012]** FIG. **8** is a perspective view of a third embodiment of an indicator;

**[0013]** FIG. **9** is a perspective view of a fourth embodiment of an indicator;

**[0014]** FIG. **10** is a cutaway view along the length of another embodiment of the apparatus;

**[0015]** FIG. **11** is a view of a gripping portion of another embodiment of the apparatus;

**[0016]** FIG. **12** is a block diagram of electronic components in the apparatus;

## DETAILED DESCRIPTION

**[0017]** One embodiment described herein is a blowgun and projectile combination wherein a sensor and display combination tracks the speed of an impelled object. In embodiments, the blowgun is primarily made of a plastic safe for children to interact and play with. In embodiments, the projectile is primarily a sphere created from any range of materials including plastic, foam, rubber, or wood. The combination is low cost and offers use as either a children's toy or a fun alternative form of a peak flow meter for young children.

**[0018]** The embodiments of a blowgun described here are configured to display the speed of projectiles impelled through the tube by the force of breath. The speed may be displayed in a variety of forms in order to give the user a way to quantitatively measure their skill. In embodiments, the user can directly measure and display the velocity of projectile going through the blowgun, allowing data to be acquired from use. This can be used as a toy by children in a competitive nature. Another use is in order to measure breathing for asthmatic children who need to measure out medication accordingly.

**[0019]** Referring to the drawings, FIG. **1** shows apparatus **110**. The rendering is not to scale. For clarity, a cutaway of the front portion of the apparatus is shown. The tube **12** has a thin wall with a hollow inside surface **16**. A flanged opening **40** may facilitate use as a mouth opening. Indicator display **20** may be placed upon tube **12**.

**[0020]** Projectile **30** has a diameter slightly smaller than the inside wall **12** to allow easy movement. Projectile **30** is preferably not much smaller than inside wall **12** to prevent blown air from escaping. The tube and projectile can be packaged as a kit.

**[0021]** Now referring to FIGS. **2** and **3**, apparatus **210** incorporates a device configured to sense velocity for the indicator display **20**. On one side of tube **12** break beam emitters **52** and **62** are mounted. The emitters **52** and **62** emit a form of light or laser **54** and **64**. The receivers **50** and **60** are mounted on the other side of tube **12** and detect emitted waves. An electronic timing device in receivers **50** and **60** relays information to through wires **70** and **80**. Processed information is displayed through display **20**. As shown in FIG. **3**, the break beams **54** emit through the middle of tube **20** in order for projectile **30** to pass through and break beams **54** and **64**.

**[0022]** Now referring to FIGS. **4** and **5**, apparatus **310** shows an alternate method of sensing and indication. A protrusion **90** in tube **12** allows for movement of a moveable vane **120**, and optionally at least one additional moveable vane **115**, connected to a rotating axle **100**. As air is impelled through tube **12**, the vanes **120** and **115** rotate axle **100** thereby rotating indicator arrow **22**. Axle **100** runs entirely through tube **12** to the outer side. Indicator arrow **22** moves along indicator display **24** displaying the speed corresponding to the force used to blow and rotate vane **115**.

**[0023]** Now referring to FIGS. **6** and **7**, the generic schematic **410** shows inside diameter **16** of tube **412** and length **14** with dimensions optimized for allowing a projectile to propel through by use of breath. Length **14** and diameter **16** may vary accordingly to projectile type and use case. In embodiments, a length **14** to diameter **16** ratio can be in the range of about 5:1 to about 20:1, or about 10:1 to about 15:1. In embodiments, the length to diameter ratio is about 12:1.

**[0024]** Various features and embodiments that can be incorporated into the embodiments shown in FIGS. **1-5** are illustrated in FIGS. **8-11**. FIG. **8** shows an alternate form of indicating for apparatus **510**. Tube **12** holds the LED **26** on display **20** according to markings **24** placed linearly to correspond to speed output. In FIG. **9**, apparatus **610** is used

to show tube **12** in a configuration utilizing frustoconical mouthpiece **40**. The mouthpiece **40** can refer to a built-in feature as part of tube **12** or as a separate piece attached to the tube by other means. In FIG. **10** apparatus **710** is shown in a cutaway view to illustrate the use of integrating a safety stopper **130** into tube **12**. Stopper **130** is a way to prevent a projectile from falling back in towards the user. In FIG. **11**, apparatus **810** has molded gripping features **140** built into tube **12** to allow easy grasp and use while impelling breath.

**[0025]** FIG. **12** illustrates a block diagram **910** of components that may be present in the apparatus. The components in diagram **910** may be embodied by hardware and/or software components in the system. Components may include a processor or processors **930**, input structure **920**, power source **940**, memory **950**, display **960**, and I/O ports **970**. Input structure **920** includes a sensor array to detect the projectile's travel. The power source **940** can be a small battery that can provide the required power to the rest of the system. The memory **950** can the electronic component that allows for the temporary or permanent storage of data about the projectile's speed. The display **960** correlates to forms of display as mentioned in other embodiments. I/O ports **970** embody the communication methods between the computing components.

**[0026]** In embodiments, a method of using the apparatus includes using the force of breath through the mouthpiece to propel the projectile and determining the velocity of the projectile by looking at the indicator.

**[0027]** In embodiments, the tube has a length in the range of about 4 inches to about 18 inches. In embodiments, the tube has an inner diameter of the range of about ¼ inch to about 2 inches. The tube typically has a thickness of about ⅛ inch to about ¼ inch. In embodiments, the apparatus is typically made of a thermoplastic material, a thermoset material, or wood. In embodiments, the projectile is typically made of a thermoplastic material, a thermoset material, foam, or wood. In embodiments, the projectile is in a weight range allowing human breath to impel the projectile a sufficient distance.

**[0028]** Although the present apparatus has been described in considerable detail with reference to certain preferred versions thereof, other versions would be readily apparent to those of ordinary skill in the art. Therefore, the spirit and scope of the description should not be limited to the description of the versions contained herein. A number of alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art, which are also intended to be encompassed by the following claims.

What is claimed is:

**1**. An apparatus comprising:
an elongated tubular component;
a mouth piece connected to the tubular component for application of air pressure;
a generally spherical projectile concentric to the tubular component;
at least one sensor attached to the tubular component; and
a visual indicator connected to the sensor(s) providing a visual indication of speed of the projectile travelling through the tubular component.

**2**. The apparatus of claim **1**, wherein said at least one sensor comprises a first trigger along a first portion of the tubular component, a second trigger along a second portion of the tubular component, a timer connected to the first and second triggers, and a processor providing output to the visual indicator from the timer.

**3**. The apparatus of claim **1**, wherein said at least one sensor comprises a thin, flexible rotating member comprising a mounting portion rigidly fixed to the tubular component, a protrusion built into the tubular component to house the rotating member, and a physical indicator fixed to the rotating member external to the tubular component.

**4**. The apparatus of claim **2**, wherein said visual indicator comprises a linear multiplicity of lights.

**5**. The apparatus of claim **1**, wherein said mouthpiece comprises a frustoconical neck.

**6**. The apparatus of claim **1**, wherein a safety stopper is proximate to the mouthpiece or in the mouthpiece.

**7**. The apparatus of claim **1**, wherein the tubular component includes a gripping portion.

**8**. A method comprising:
obtaining an apparatus comprising an elongated tubular components, a mouth piece, a generally spherical projectile, and a velocity sensor configured to sense the velocity of the projectile traveling through the tubular component;
blowing through and ejecting the projectile; and
reading the projectile velocity output on a display.

**9**. The method of claim **8**, wherein reading comprises reading an electronic display.

**10**. The method of claim **8**, wherein reading comprises reading a non-digital display.

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