



US 20250257985A1

(19) **United States**

(12) **Patent Application Publication**  
**CHIA**

(10) **Pub. No.: US 2025/0257985 A1**

(43) **Pub. Date: Aug. 14, 2025**

(54) **DART WITH POWDER-FILLED CAP AND  
BOTTLE FOR FILLING A DART CAP WITH  
POWDER**

**Publication Classification**

(51) **Int. Cl.**  
**F42B 6/00** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **F42B 6/003** (2013.01)

(71) Applicant: **EASEBON SERVICES LIMITED,**  
Kwun Tong (HK)

(72) Inventor: **Francis See Chong CHIA,** Kowloon  
(HK)

(21) Appl. No.: **18/702,406**

(22) PCT Filed: **May 5, 2023**

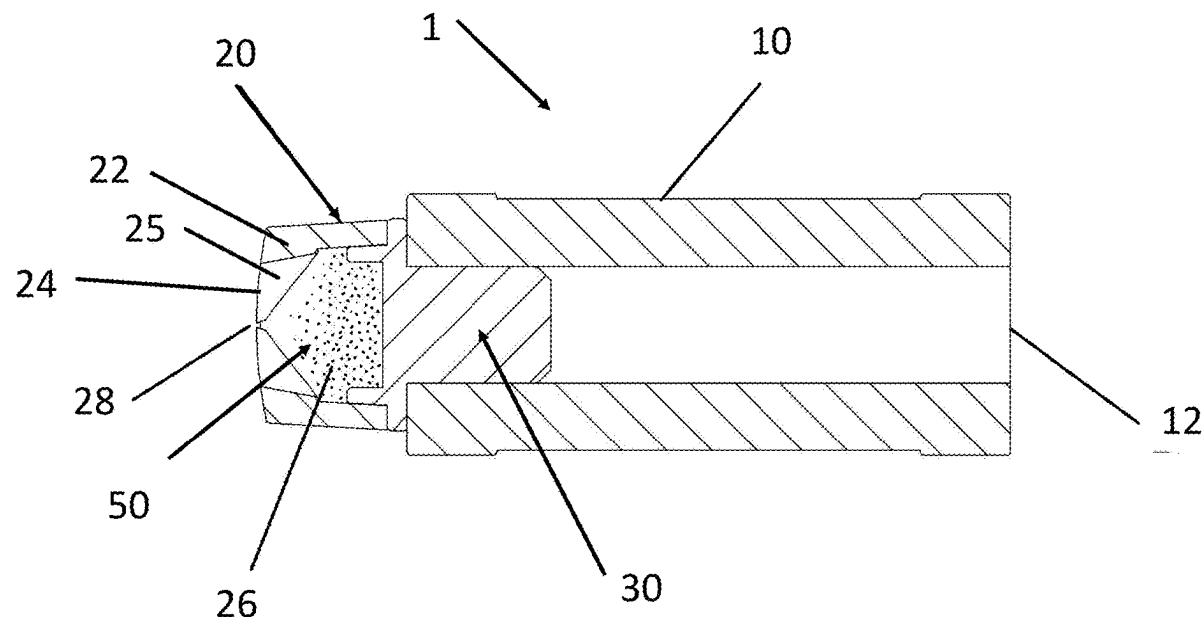
(86) PCT No.: **PCT/SG2023/050305**

§ 371 (c)(1),

(2) Date: **Apr. 18, 2024**

(57) **ABSTRACT**

A toy dart including a main body and a cap connected to the main body. The cap includes a side wall, a front wall, a hollow chamber defined by the side wall and the front wall, and at least one opening formed in the front wall and in communication with the hollow chamber. A powdered substance is disposed within the hollow chamber. In an exemplary embodiment, the powdered substance is loaded into the dart through the at least one opening using a bottle with a nozzle.



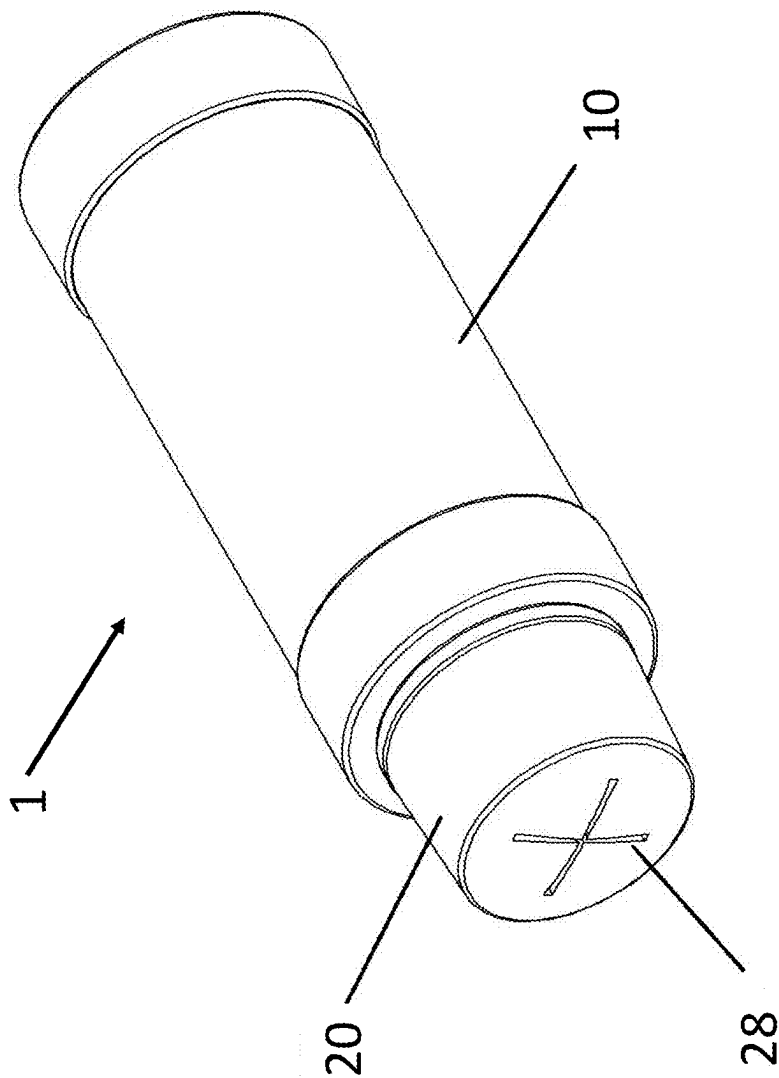


FIG. 1A

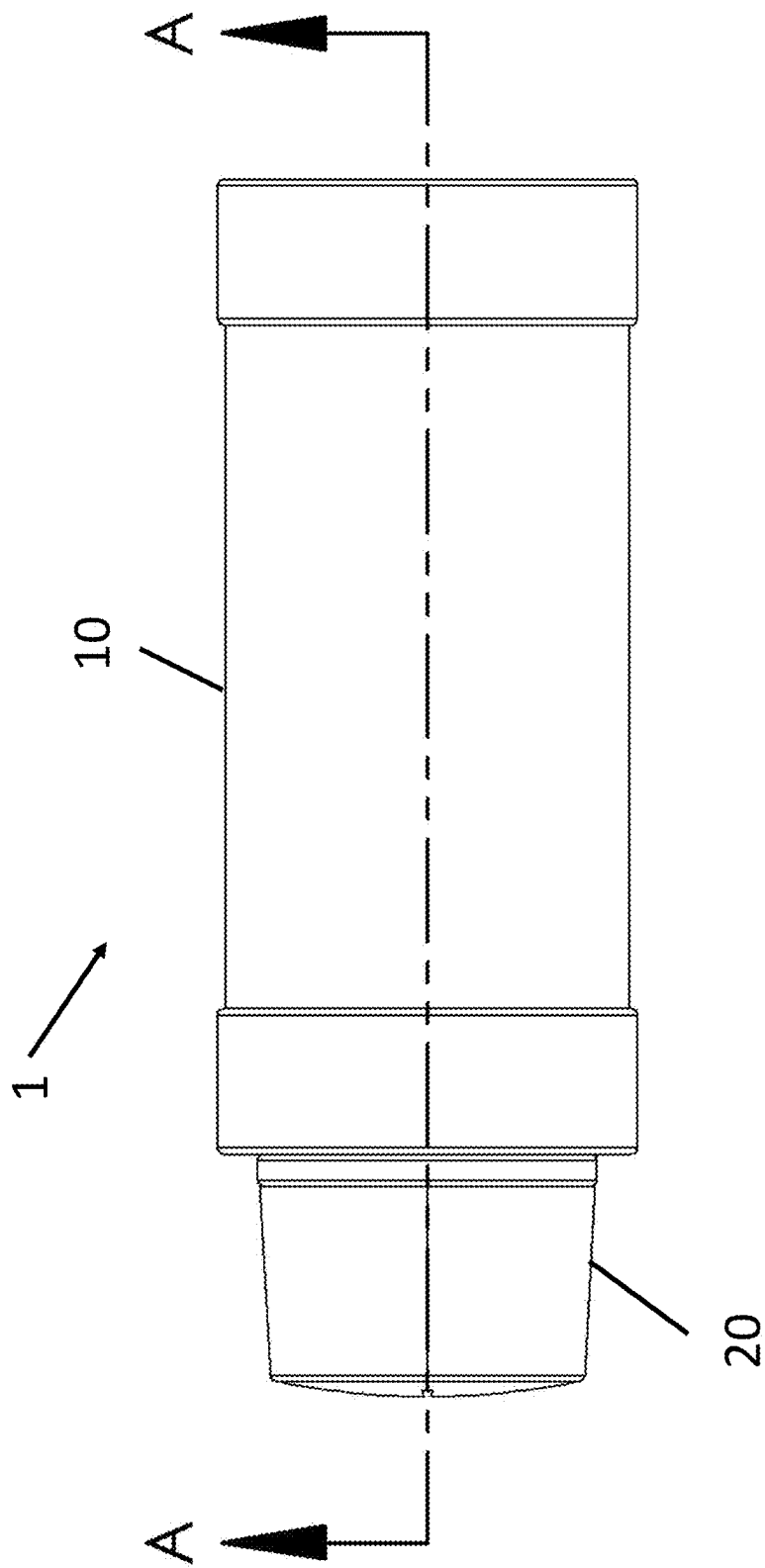


FIG. 1B

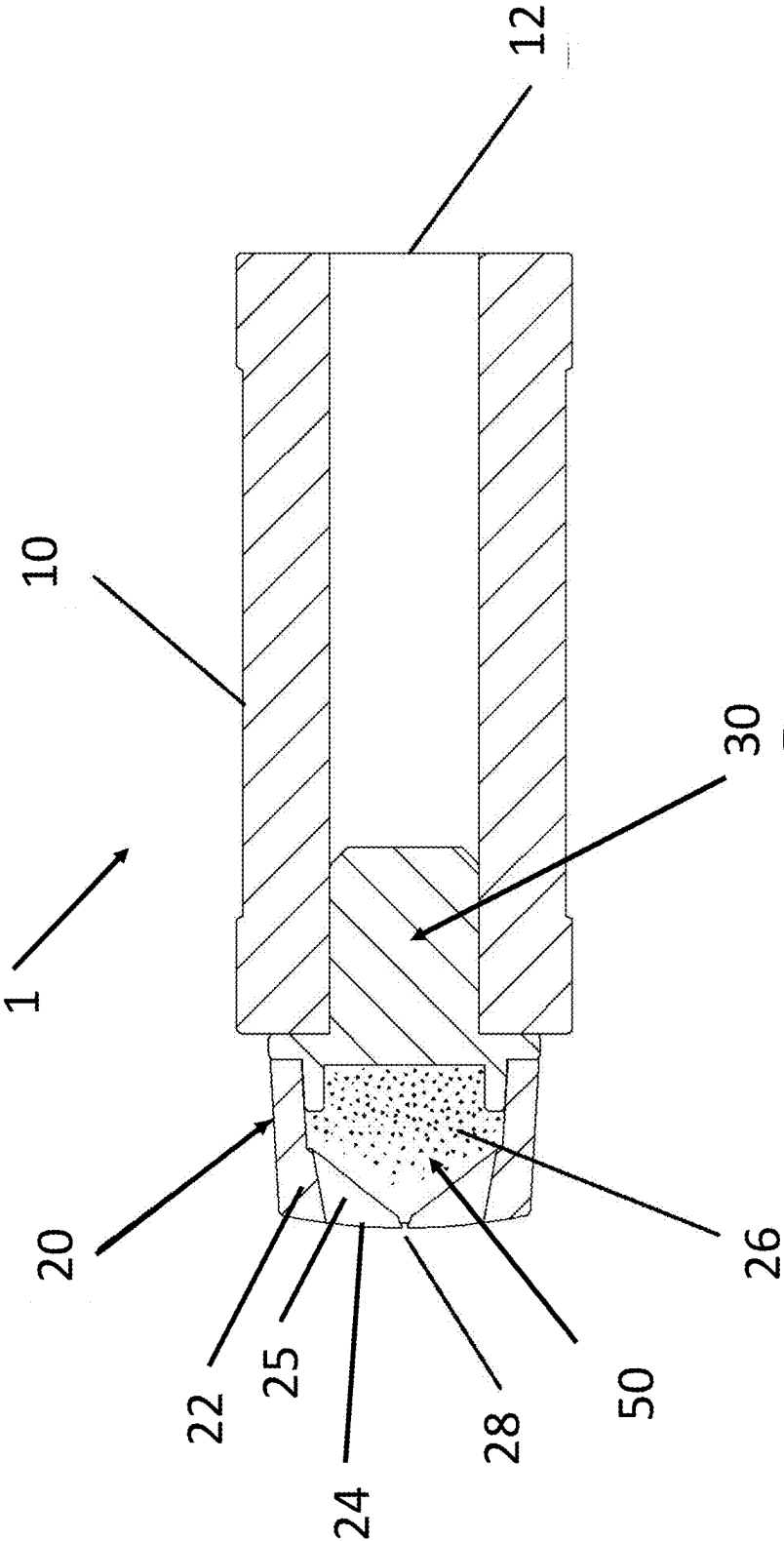


FIG. 1C

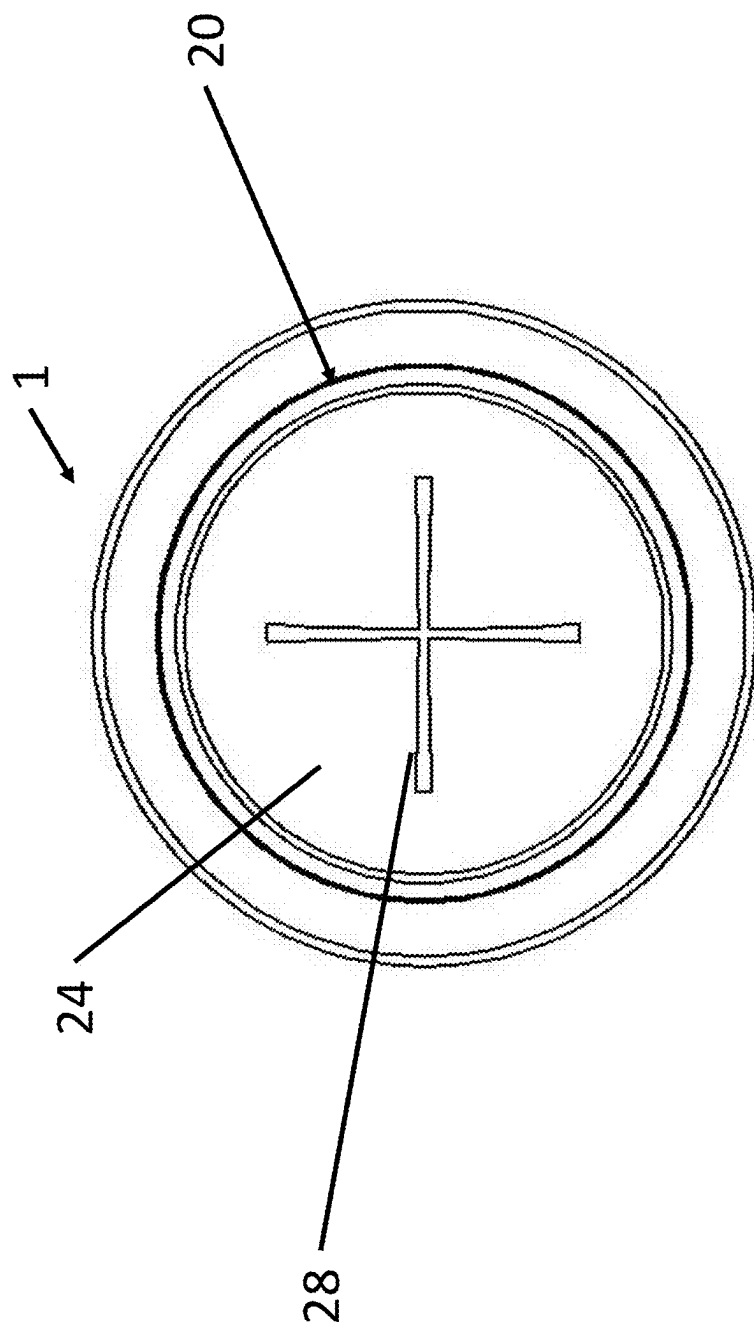


FIG. 1D

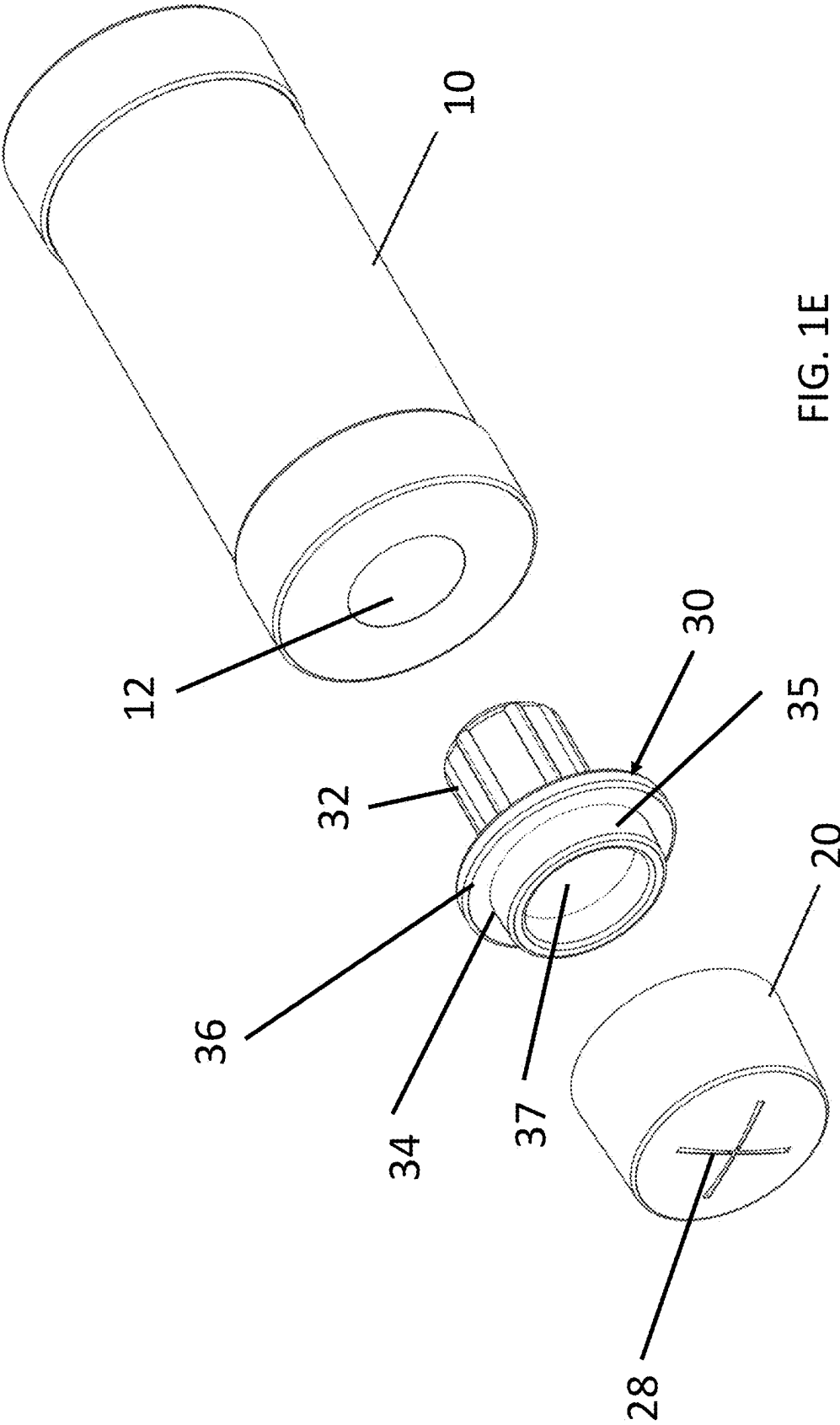
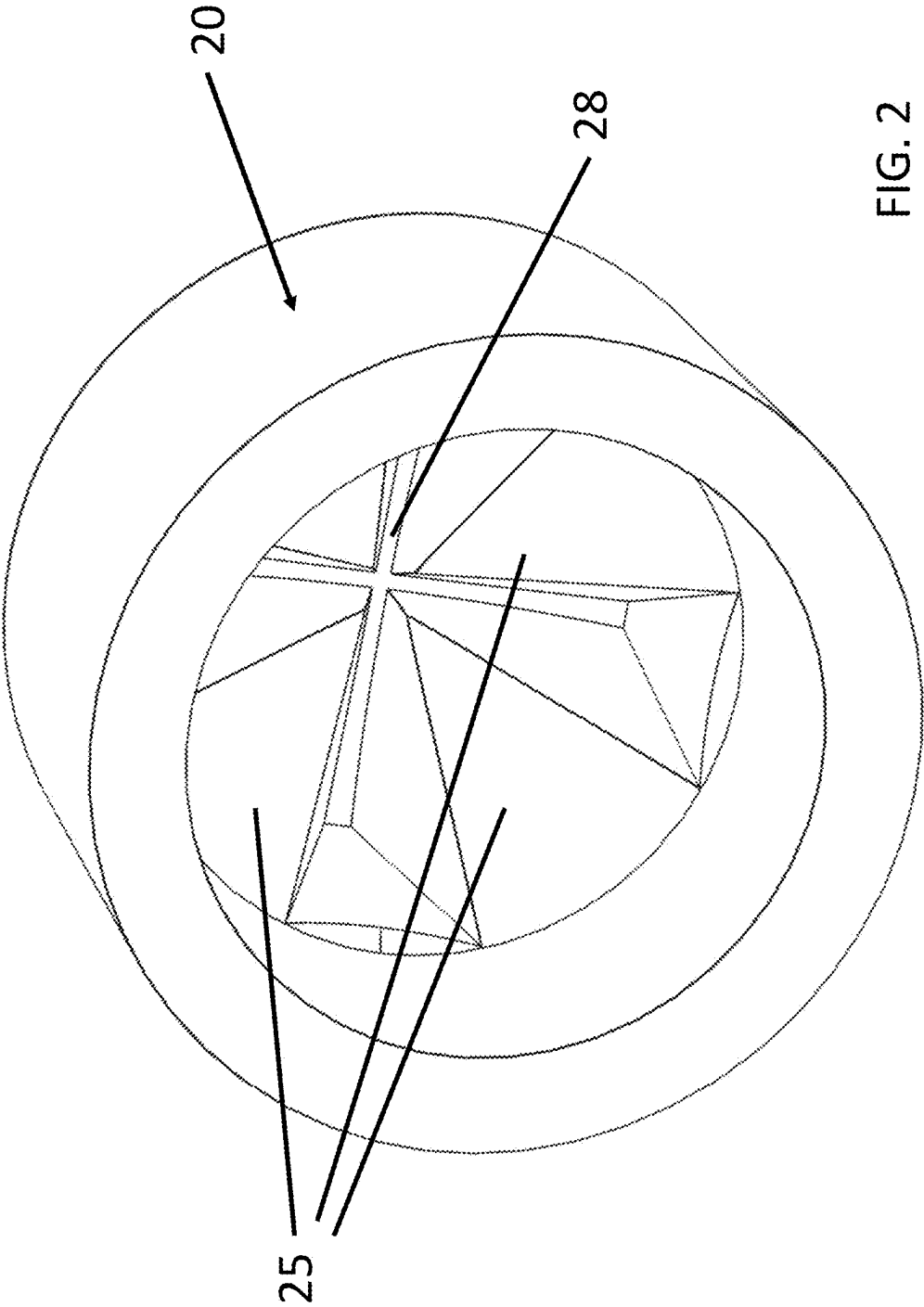


FIG. 1E



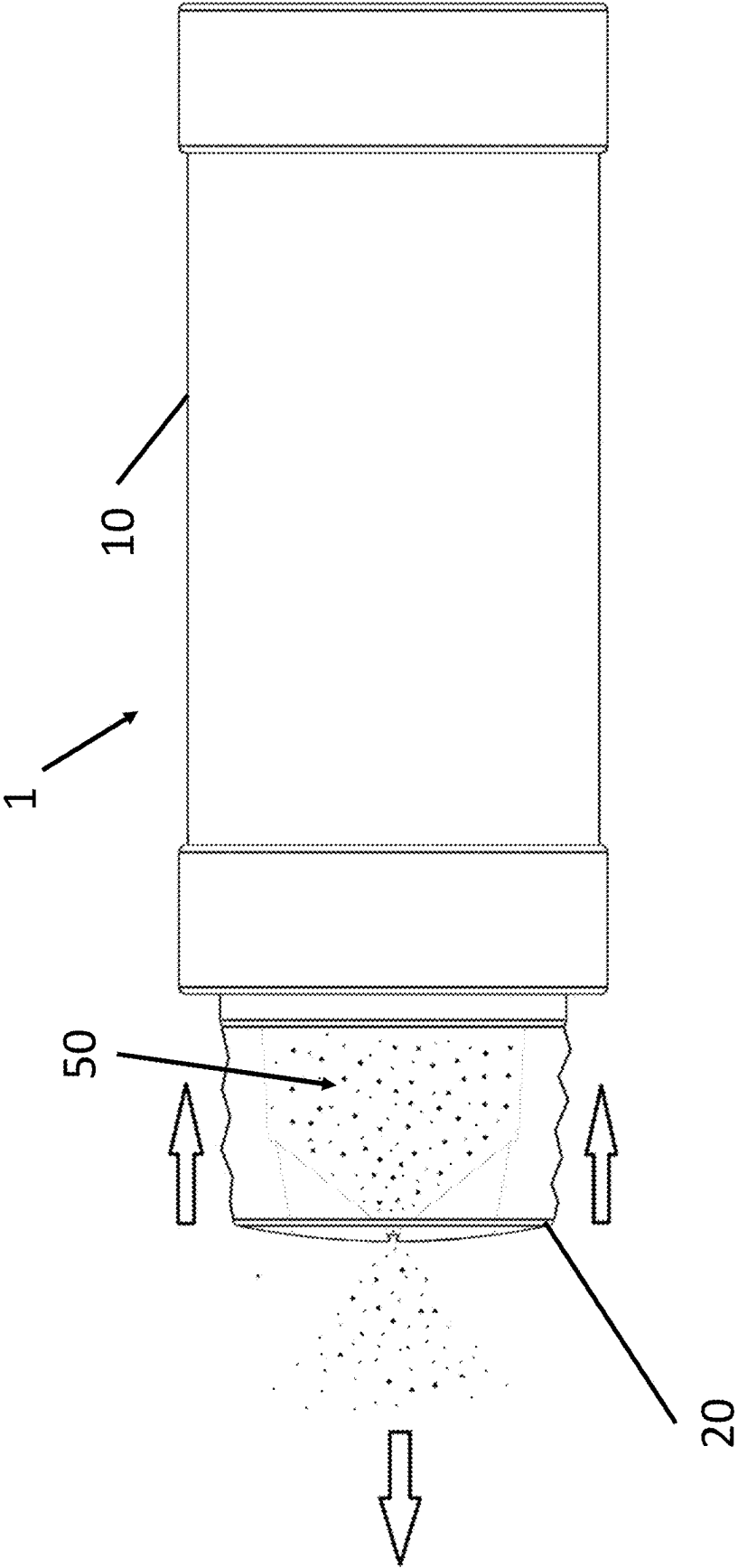
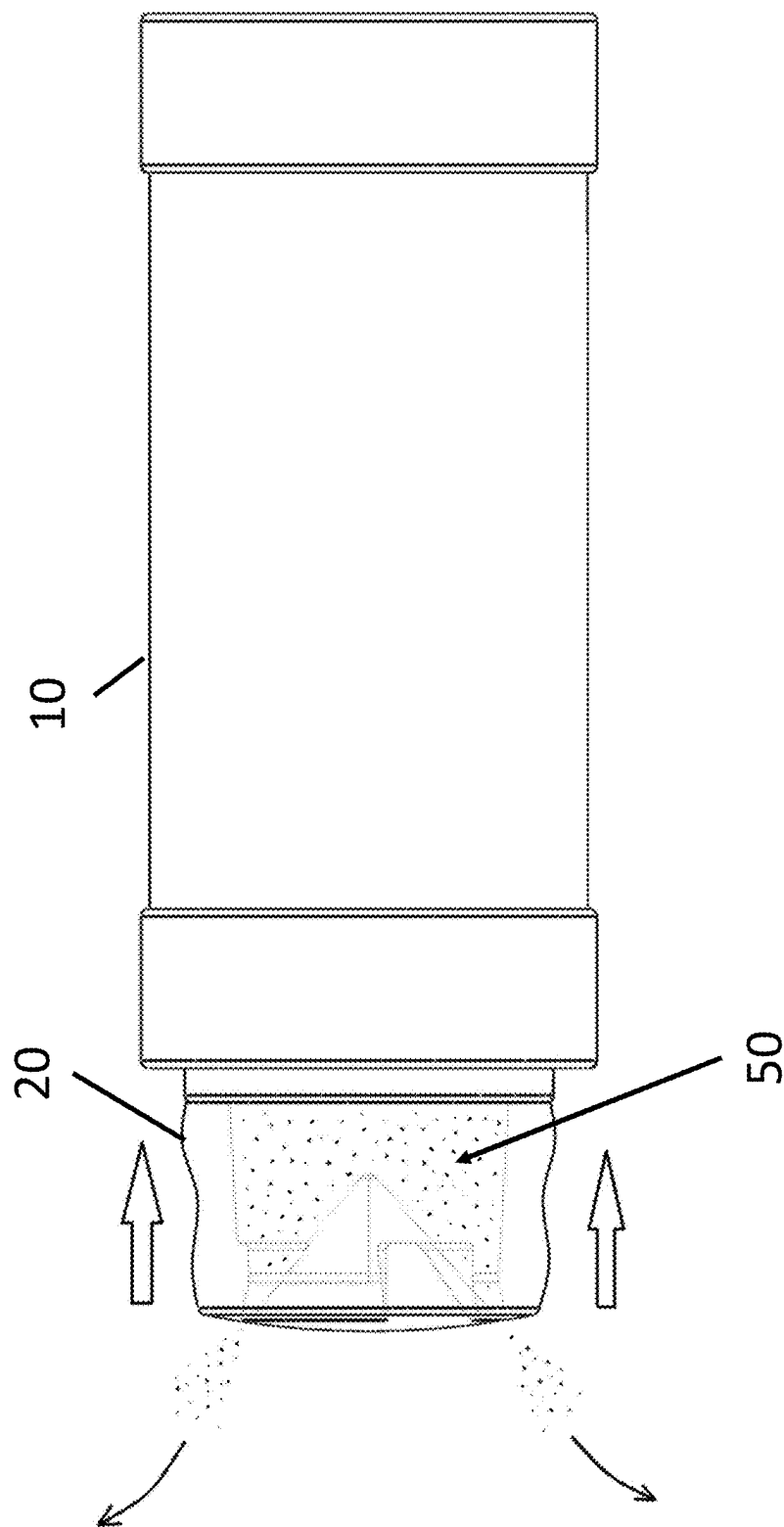


FIG. 3A





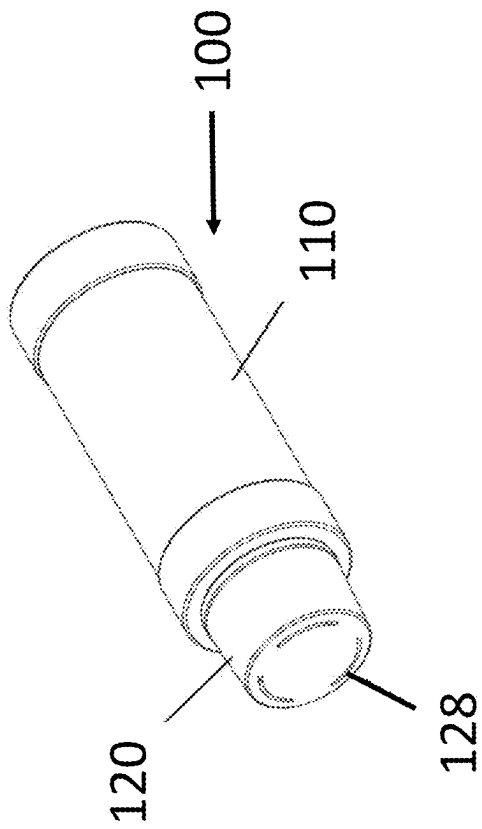


FIG. 4A

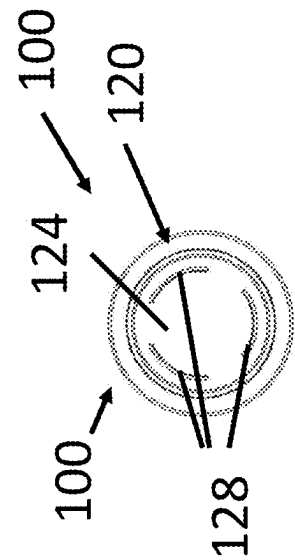


FIG. 4D

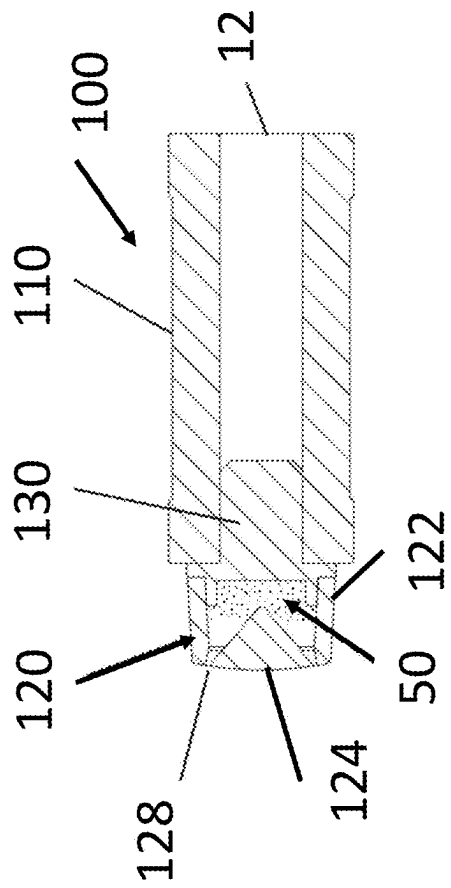


FIG. 4C

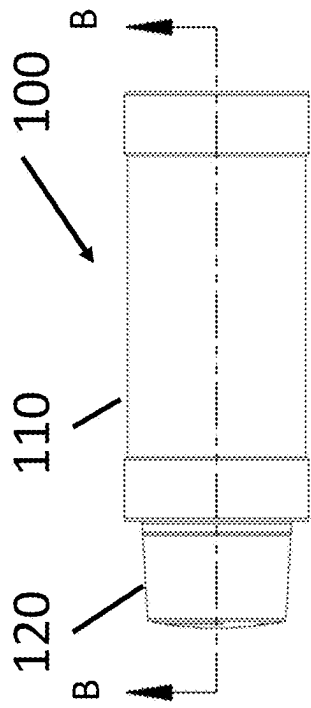


FIG. 4B

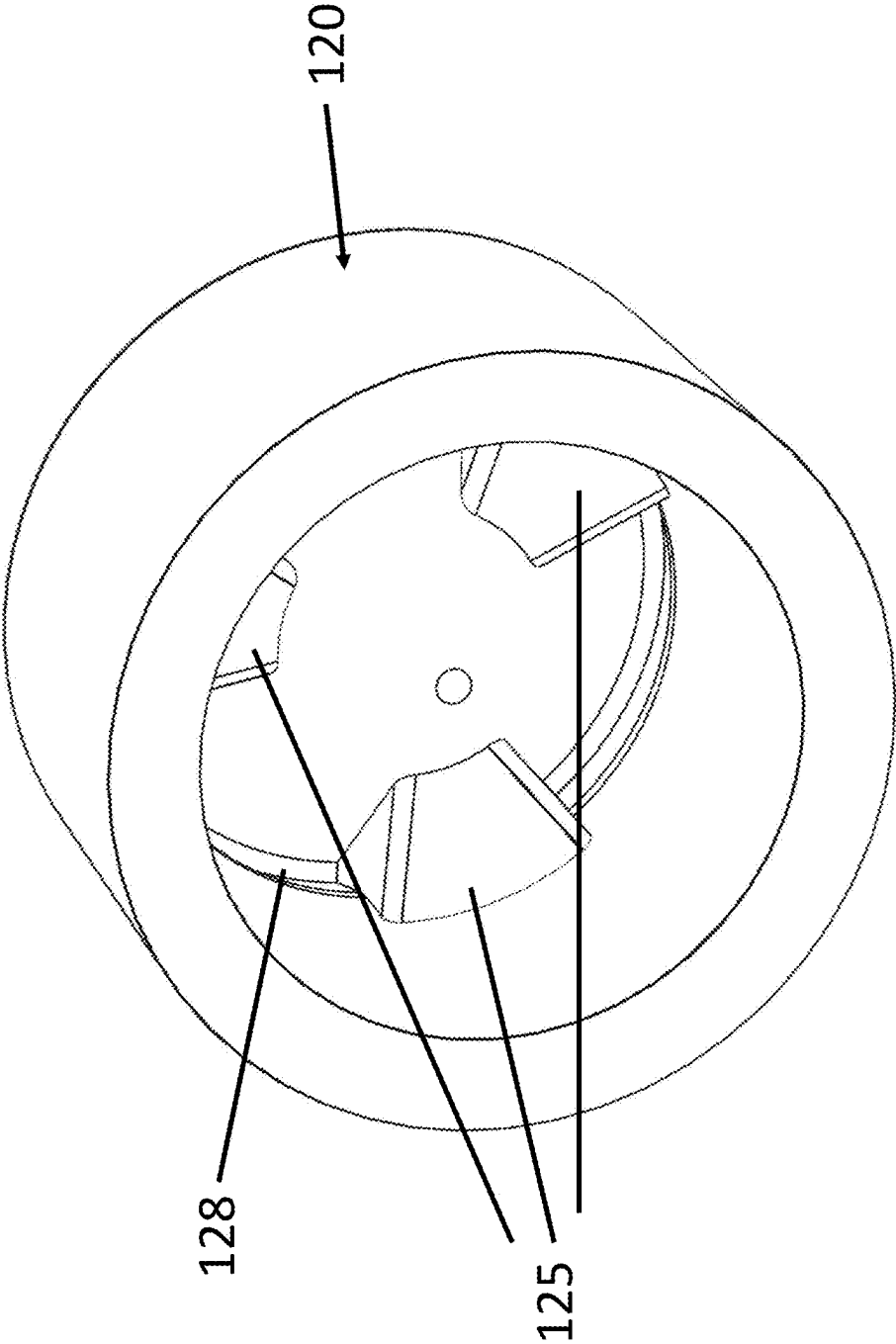
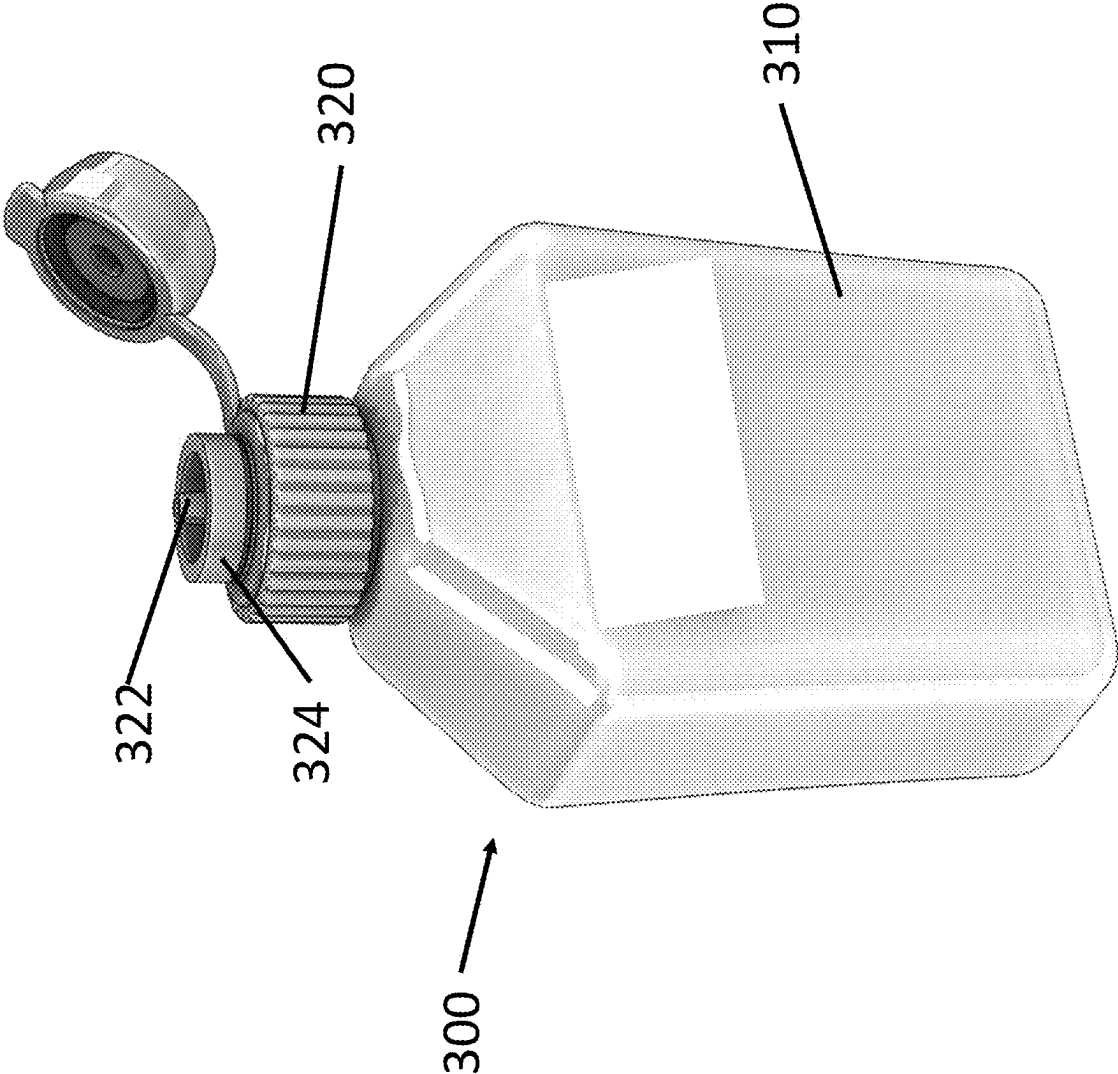


FIG. 5



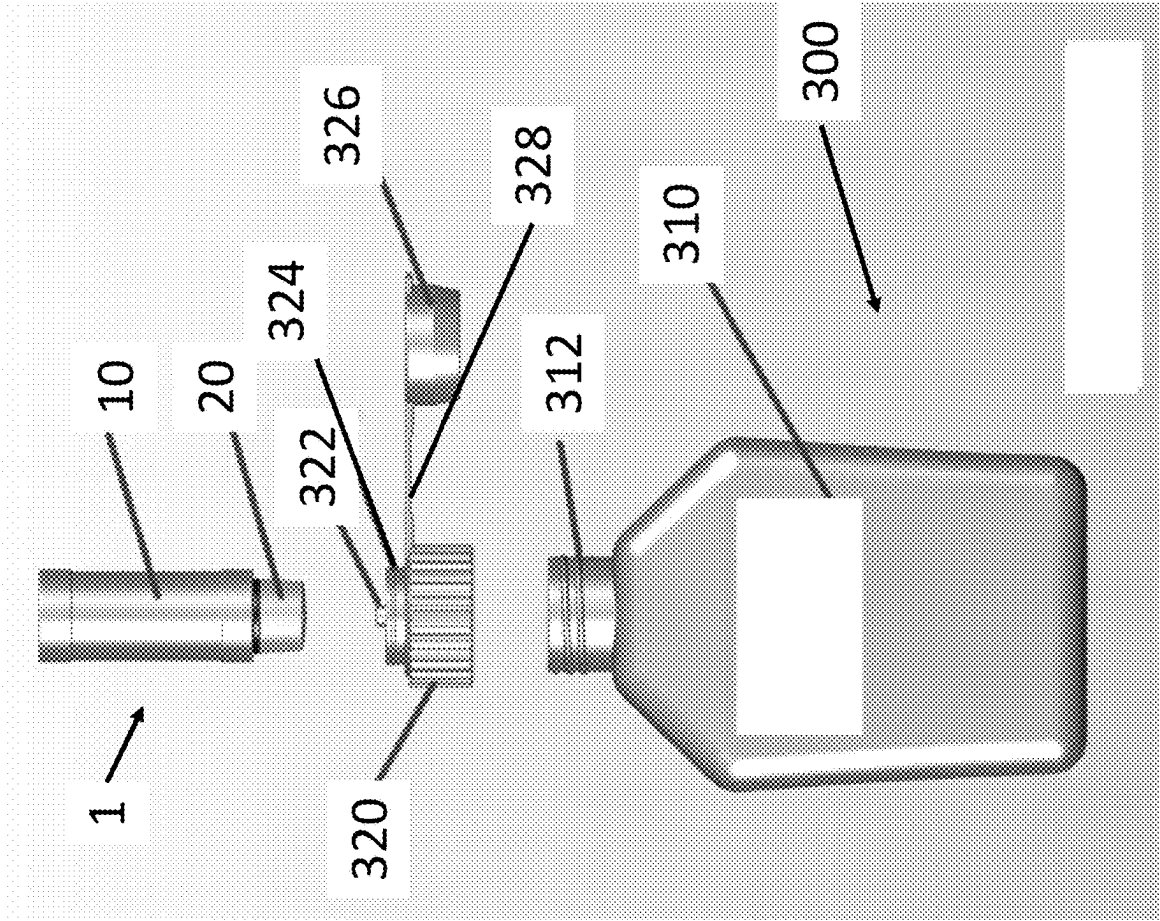
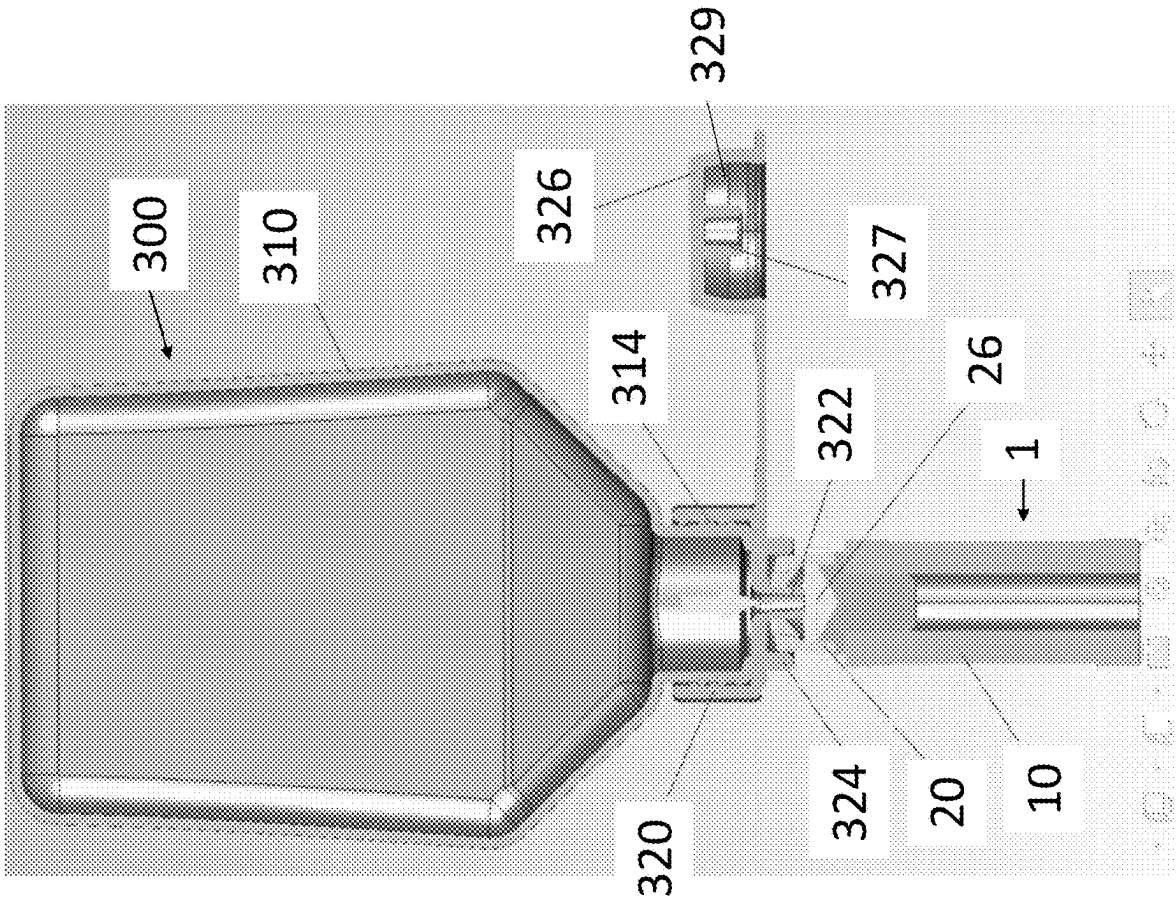


FIG. 6B



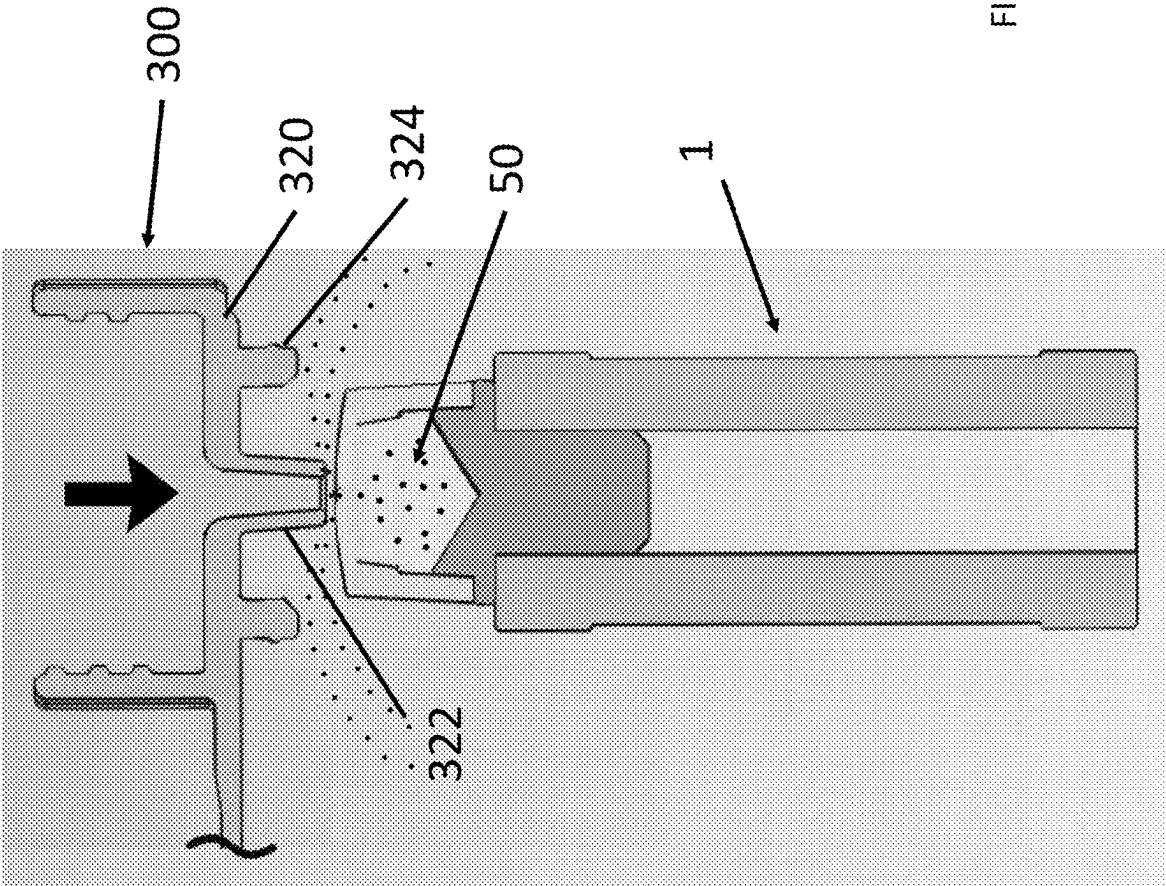


FIG. 7B

## **DART WITH POWDER-FILLED CAP AND BOTTLE FOR FILLING A DART CAP WITH POWDER**

### **FIELD**

**[0001]** The present disclosure is generally related to a toy projectiles, such as foam bullets, darts, balls, and the like, that may be launched with a toy gun.

### **BACKGROUND**

**[0002]** Traditional toy projectile launchers have utilized various forms of rifles, pistols, blasters, machine guns, and the like, for launching toy projectiles, such as foam balls, darts, to name a few. Such toy launchers have varied in size, power, storage capacity, to name a few. More specifically, toy launchers of foam projectiles—bullets (or “darts”), balls, and the like—have become ubiquitous. There have been various types of rifles, machine guns, and the like, that have been marketed for launching such foam projectiles.

**[0003]** When people play with high velocity foam dart blasters at competitive events, being “tagged/hit” depends on visual supervision from appointed referees, as well as a personal honor code. For example, a player may raise his/her hand or provide some other signal when the player believes he/she has been hit and may then leave the arena.

**[0004]** However, there are a number of issues related to the conventional technique of determining whether a player has been hit or tagged. For example, in a situation where a number of contestants are running around in different directions, and the foam darts are small and flying at high speeds, it is often difficult to know/verify who has been tagged/hit. Further, when a contestant is wearing thick clothing during cooler weather in an outside environment, the player might not feel/know that he/she has been tagged/hit. Subsequently, arguments may arise. Some venues mount multiple cameras to record the play. Even then, disputes could involve lengthy playback in slow motion.

**[0005]** Accordingly, there is a need for an improved technique for determining tags/hits in a toy launcher tournament or other toy launcher play environments.

### **SUMMARY**

**[0006]** To address the above, exemplary embodiments of the present invention provide a toy dart that is loaded with a powdered substance that is released on impact with a target to mark the target as being hit or tagged. For example, the powdered substance may have a specific color that indicates a player has been hit/tagged. The dart may include features that compensate for the added weight of the powdered substance so that the dart can still be launched at appropriate speeds and with accuracy.

**[0007]** A toy dart according to an exemplary embodiment of the present invention comprises: a main body; a cap connected to the main body, the cap comprising: a side wall; a front wall; a hollow chamber defined by the side wall and the front wall; and at least one opening formed in the front wall and in communication with the hollow chamber; and a powdered substance disposed within the hollow chamber.

**[0008]** In an exemplary embodiment, the toy dart further comprises a plug portion disposed between the main body and the cap.

**[0009]** In an exemplary embodiment, the plug portion comprises a distal end portion made up of a flat surface and a wall surrounding the flat surface.

**[0010]** In an exemplary embodiment, the flat surface forms a closed bottom of the hollow chamber.

**[0011]** In an exemplary embodiment, the wall of the plug portion is configured for insertion into an opening in a proximal portion of the cap.

**[0012]** In an exemplary embodiment, the plug portion further comprises a proximal end portion configured for insertion into the main body.

**[0013]** In an exemplary embodiment, the at least one opening formed in the front wall has a cross shape.

**[0014]** In an exemplary embodiment, the at least one opening formed in the front wall comprises a plurality of openings.

**[0015]** In an exemplary embodiment, the at least one opening in the front wall is disposed along an edge of the front wall.

**[0016]** In an exemplary embodiment, the front wall comprises thickened portions.

**[0017]** In an exemplary embodiment, the powdered substance is chalk.

**[0018]** A kit according to an exemplary embodiment of the present invention comprises: (A) at least one toy dart comprising: 1) a main body; 2) a cap connected to the main body, the cap comprising: a side wall; a front wall; a hollow chamber defined by the side wall and the front wall; and at least one opening formed in the front wall and in communication with the hollow chamber; and 3) a powdered substance disposed within the hollow chamber; and (B) a bottle for storing the powdered substance and inserting the powdered substance into the at least one toy dart, the bottle comprising: 1) a container; and 2) a lid comprising a nozzle and a wall surrounding the nozzle, the nozzle configured for insertion into the at least one opening formed in the front wall of the cap of the at least one toy dart.

**[0019]** In an exemplary embodiment, the bottle further comprises a cap configured for placement over the lid to cover the nozzle and the wall.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0020]** Exemplary embodiments of the present invention will be described with references to the accompanying figures, wherein:

**[0021]** FIG. 1A is a perspective view of a toy dart according to an exemplary embodiment of the present invention;

**[0022]** FIG. 1B is side view of a toy dart according to an exemplary embodiment of the present invention;

**[0023]** FIG. 1C is a cross sectional view of the toy dart taken along the line A-A in FIG. 1B according to an exemplary embodiment of the present invention;

**[0024]** FIG. 1D is a front view of a toy dart according to an exemplary embodiment of the present invention;

**[0025]** FIG. 1E is an exploded view of a toy dart according to an exemplary embodiment of the present invention;

**[0026]** FIG. 2 is a perspective view of a cap of a toy dart according to an exemplary embodiment of the present invention;

**[0027]** FIGS. 3A and 3B show operation a toy dart according to an exemplary embodiment of the present invention;

**[0028]** FIG. 4A is a perspective view of a toy dart according to an exemplary embodiment of the present invention;



[0029] FIG. 4B is side view of a toy dart according to an exemplary embodiment of the present invention;

[0030] FIG. 4C is a cross sectional view of the toy dart taken along the line B-B in FIG. 4B according to an exemplary embodiment of the present invention;

[0031] FIG. 4D is a front view of a toy dart according to an exemplary embodiment of the present invention;

[0032] FIG. 4E is an exploded view of a toy dart according to an exemplary embodiment of the present invention;

[0033] FIG. 5 is a perspective view of a cap of a toy dart according to an exemplary embodiment of the present invention;

[0034] FIG. 6A is a perspective view of a bottle according to an exemplary embodiment of the present invention;

[0035] FIG. 6B is an exploded view of a bottle according to an exemplary embodiment of the present invention; and

[0036] FIGS. 7A and 7B show a process for loading a toy dart with a powdered substance according to an exemplary embodiment of the present invention.

#### DETAILED DESCRIPTION

[0037] FIGS. 1A-1E show of a dart, generally designated by reference number 1, according to an exemplary embodiment of the present invention, with FIG. 1C being a cross section view of the dart 1 taken along the line A-A in FIG. 1B. The dart 1 includes a main body 10 and a cap 20. The main body 10 is a generally hollow cylindrical-shaped member made of a soft and flexible material, such as, for example, foam. In exemplary embodiments, the main body 10 may have one or more ridges at various points along the main body 10, such as, for example, as shown in the drawings at the proximal and distal end portions of the main body 10. The main body 10 has a hollow interior 12. In exemplary embodiments, the dart 1 may be propelled from a toy launcher by pushing compressed air into the hollow interior 12 of the main body 10.

[0038] The cap 20 of the dart 1 is also generally cylinder-shaped or in the shape of truncated cone, with a smaller longitudinal dimension as compared to the longitudinal dimension of the main body 10. The cap 20 is made up of a side wall 22 and front wall 24, both having interior and exterior surfaces. As best shown in FIG. 2, the interior surface of the front wall 24 includes thickened portions 25 that radiate outward from a center point of the front wall 24. The walls 22, 24 may together form a unitary piece and may be made of flexible material, such as, for example, plastic. As shown in FIG. 2, the cap 20 has an open proximal end.

[0039] As shown in FIG. 1E, the dart 1 also includes a plug member 30 having an elongated proximal end portion 32 configured for insertion into a distal end of the hollow interior 12 of the main body 10. The proximal end portion 32 may be held in the hollow interior 12 by, for example, friction fit and/or adhesive. The plug member 30 also includes a distal end portion 34 and a middle portion 36 disposed between the proximal end portion 32 and the distal end portion 34. The middle portion 36 has a diameter that is larger than that of the proximal and distal end portions 32, 34 and which is substantially equal to the diameter of a proximal end portion of the cap 20. In exemplary embodiments, the distal end portion 34 of the plug member 30 has an outer wall 35 that surrounds a generally flat surface 37. In exemplary embodiments, the outer wall 35 is configured for insertion into the open proximal end of the cap 20, so that the flat surface 37 of the distal end portion 34 of the plug

member 30 together with the side wall 22 and front wall 24 of the cap 20 form a hollow chamber 26. The outer wall 35 may be held within the open proximal end of the cap 20 by, for example, friction fit, adhesive and/or threaded connection.

[0040] It should be appreciated that the plug member 30 need not be a separate member from the main body 10 and/or the cap 20, and in exemplary embodiments the plug member 30 may form a unitary structure with the main body 10 and/or cap 20.

[0041] A cross-shaped opening 28 is formed in the front wall 24 of the cap 20 (i.e., the front surface of the cap 20) and in communication with the hollow chamber 26. In exemplary embodiments, a powdered substance 50, such as, for example, chalk, may be housed within the hollow chamber 26. As shown in FIGS. 3A and 3B, upon impact of the dart 1 on a target, the cap 20 is compressed, resulting in ejection of the powdered substance 50 from the cross-shaped opening 28. In this regard, the powdered substance 50 may be colored to easily stand out on the target to allow other players and/or referees in a tournament to recognize when the target has been hit. In exemplary embodiments, the powdered substance 50 may have a red, blue or yellow color, or any other suitable color.

[0042] When the hollow chamber 26 is only partially filled with the powdered substance 50, the substance might shift to the bottom of the hollow chamber 26 due to gravity. This will affect the center of gravity for the dart 1, and, when the dart is in flight, the slight difference in the center of gravity might affect the trajectory and subsequent accuracy of the dart 1. To address this issue, the thickened portions 25 of the front wall 24 moves the center of gravity forward and acts as a counter-balance to any shifting in weight resulting from movement of the powdered substance 50 within the cap 20. This enhances the stability of the dart 1 in flight and allows the dart 1 to be launched with more accuracy.

[0043] FIGS. 4A-4D and 5 show a dart, generally designated by reference number 100, according to another exemplary embodiment of the present invention. The dart 100 is generally the same as the dart 1, but instead of a cross-shaped opening 28, the cap 120 of the dart 100 has one or more openings 128 along the edge of the front surface of the cap 120.

[0044] As with the dart 1, the dart 100 includes a main body 110, and the cap 120 is made up of a side wall 122 and front wall 124. The front wall 124 includes thickened portions 125 that shift the center of gravity of the dart 100 forward to compensate for the powdered substance 150 in the cap 120. In exemplary embodiments, the thickened portions 125 are located between the openings 128 in the cap 120. The dart 100 further includes a plug member 130 disposed between the main body 110 and the cap 120.

[0045] It should be appreciated that the location of the openings in the cap are not limited to that described herein, and in exemplary embodiments the openings may be disposed at other locations, such as, for example, along the rim of the cap.

[0046] FIGS. 6A and 6B show a bottle, generally designated by reference number 300, according to an exemplary embodiment of the present invention. The bottle 300 includes a container 310 and a lid 320. The bottle 300 stores the powdered substance 50 and may be used to load the dart 1 with the powdered substance 50. The bottle 300 may be provided to a user as a kit that includes one or more darts 1.

The kit may contain a variety of bottles **300**, each containing a differed colored powdered substance. The darts **1** contained in the kit may also have different colors from one another.

**[0047]** The container **310** includes a finish portion **312** with an opening in communication with the hollow interior of the bottle **310**. The exterior surface of the finish portion **312** may include threaded portions **314** that are configured to mate with threaded portions on the interior surface of the lid **320** so that the lid **320** may be couple and decoupled from the finish portion **312** with an easy twisting motion.

**[0048]** The lid **320** includes a nozzle **322** that extends from a top surface of the lid **320** and a top wall **324** that surrounds the nozzle **322**. The bottle **300** also includes a cap **326** that may be fixed to the lid **320** by a tether **328** and is configured for placement over the nozzle **322** and top wall **324** when the bottle **300** is not in use. In this regard, the cap **326** may have open portions **327**, **329** that correspond to the nozzle **322** and the top wall **324** so that the cap **326** completely covers the nozzle **322** and top wall **324** when the cap **326** is placed on the lid **320** to prevent the powdered substance from leaking from the bottle **300** when not in use. In exemplary embodiments, when the bottle **300** is in a closed configuration, the cap **322** may be held in place over the lid **320** by a snap fit.

**[0049]** As shown in FIGS. 7A and 7B, a process for loading the dart **1** with the powdered substance **50** according to an exemplary embodiment includes placing the dart **1** in an upright position so that the dart cap **20** is facing upwards. The bottle **300** is then turned upside down and the nozzle **322** is inserted into the opening **28** in the dart cap **20**. The container **310** can then be squeezed to expel the powdered substance through the nozzle **322** and into the dart cap **20**. **[0050]** The top wall **324** minimizes upward movement of excess powder that might occur due to overflow. This avoids unwanted contact with the powder during the filling process.

**[0051]** While particular embodiments of the present invention have been shown and described in detail, it would be obvious to those skilled in the art that various modifications and improvements thereon may be made without departing from the spirit and scope of the invention. It is therefore intended to cover all such modifications and improvements that are within the scope of this invention.

1. A toy dart comprising:
  - a main body;
  - a cap connected to the main body, the cap comprising:
    - a side wall;
    - a substantially flat front wall;
    - a hollow chamber defined by the side wall and the front wall; and
    - at least one opening formed in the front wall and in communication with the hollow chamber; and
  - a powdered substance disposed within the hollow chamber.
2. The toy dart of claim 1, further comprising a plug portion disposed between the main body and the cap.
3. The toy dart of claim 2, wherein the plug portion comprises a distal end portion made up of a flat surface and a wall surrounding the flat surface.
4. The toy dart of claim 3, wherein the flat surface forms a closed bottom of the hollow chamber.
5. The toy dart of claim 3, wherein the wall of the plug portion is configured for insertion into an opening in a proximal portion of the cap.

6. The toy dart of claim 3, wherein the plug portion further comprises a proximal end portion configured for insertion into the main body.

7. The toy dart of claim 1, wherein the at least one opening formed in the front wall has a cross shape.

8. The toy dart of claim 1, wherein the at least one opening formed in the front wall comprises a plurality of openings.

9. The toy dart of claim 1, wherein the at least one opening in the front wall is disposed along an edge of the front wall.

10. The toy dart of claim 1, wherein the front wall comprises thickened portions.

11. The toy dart of claim 1, wherein the powdered substance is chalk.

12. A kit comprising:

(A) at least one toy dart comprising:

- 1) a main body;
- 2) a cap connected to the main body, the cap comprising:
  - a side wall;
  - a substantially flat front wall;
  - a hollow chamber defined by the side wall and the front wall; and
  - at least one opening formed in the front wall and in communication with the hollow chamber; and
- 3) a powdered substance disposed within the hollow chamber; and

(B) a bottle for storing the powdered substance and inserting the powdered substance into the at least one toy dart, the bottle comprising:

- 1) a container; and
- 2) a lid comprising a nozzle and a wall surrounding the nozzle, the nozzle configured for insertion into the at least one opening formed in the front wall of the cap of the at least one toy dart to load the hollow chamber of the at least one dart with the powdered substance.

13. The kit of claim 12, wherein the bottle further comprises a cap configured for placement over the lid to cover the nozzle and the wall.

14. The kit of claim 12, wherein the at least one toy dart further comprises a plug portion disposed between the main body and the cap.

15. The toy dart of claim 14, wherein the plug portion comprises a distal end portion made up of a flat surface and a wall surrounding the flat surface.

16. The kit of claim 15, wherein the flat surface forms a closed bottom of the hollow chamber.

17. The kit of claim 15, wherein the wall of the plug portion is configured for insertion into an opening in a proximal portion of the cap of the toy dart.

18. The kit of claim 15, wherein the plug portion further comprises a proximal end portion configured for insertion into the main body.

19. The kit of claim 12, wherein the at least one opening formed in the front wall has a cross shape.

20. The kit of claim 12, wherein the at least one opening formed in the front wall comprises a plurality of openings.

21. The kit of claim 12, wherein the at least one opening in the front wall is disposed along an edge of the front wall.

22. The kit of claim 12, wherein the front wall comprises thickened portions.

23. The kit of claim 12, wherein the powdered substance is chalk.

\* \* \* \* \*