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

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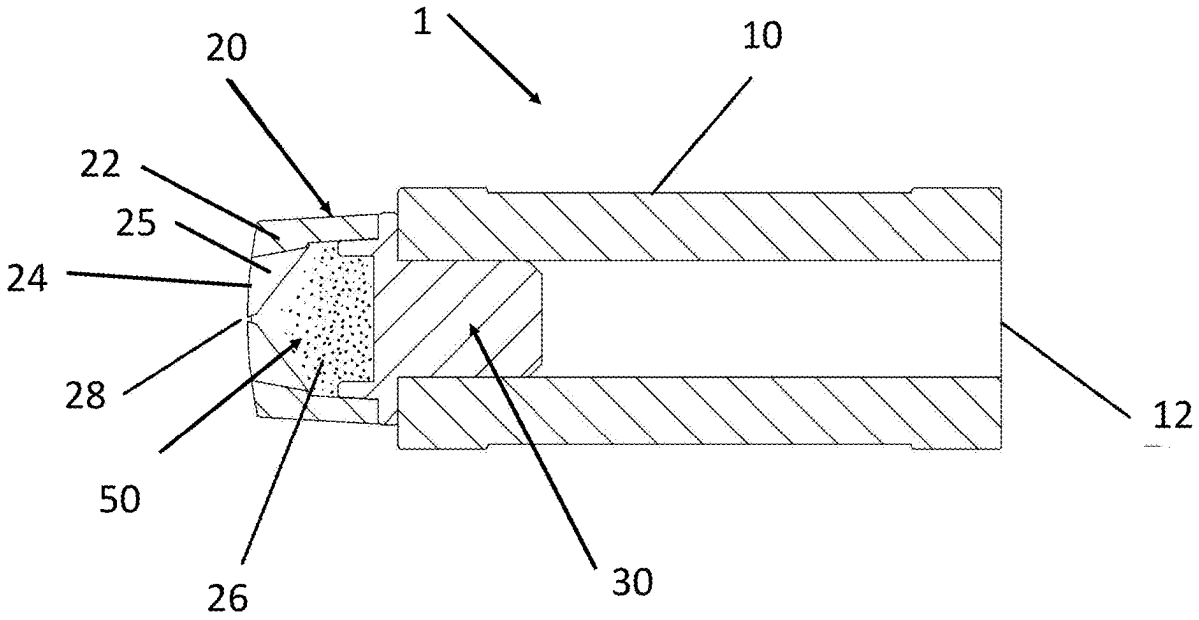
(57) **ABSTRACT**

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.



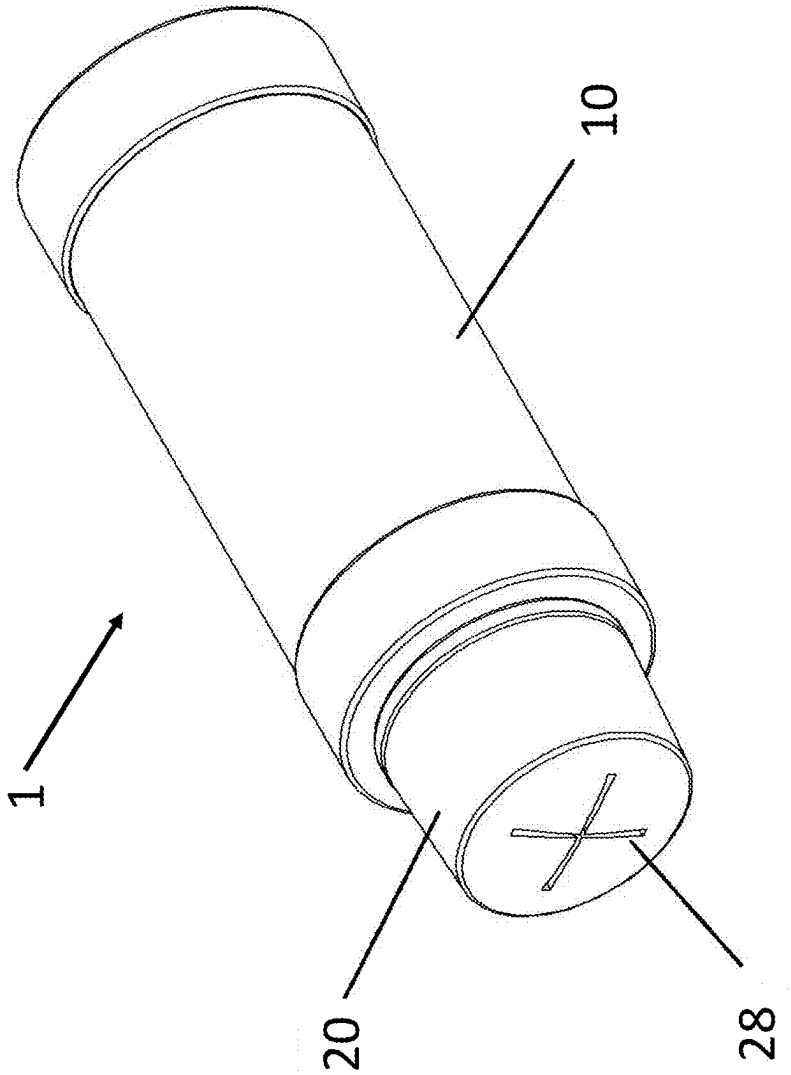


FIG. 1A

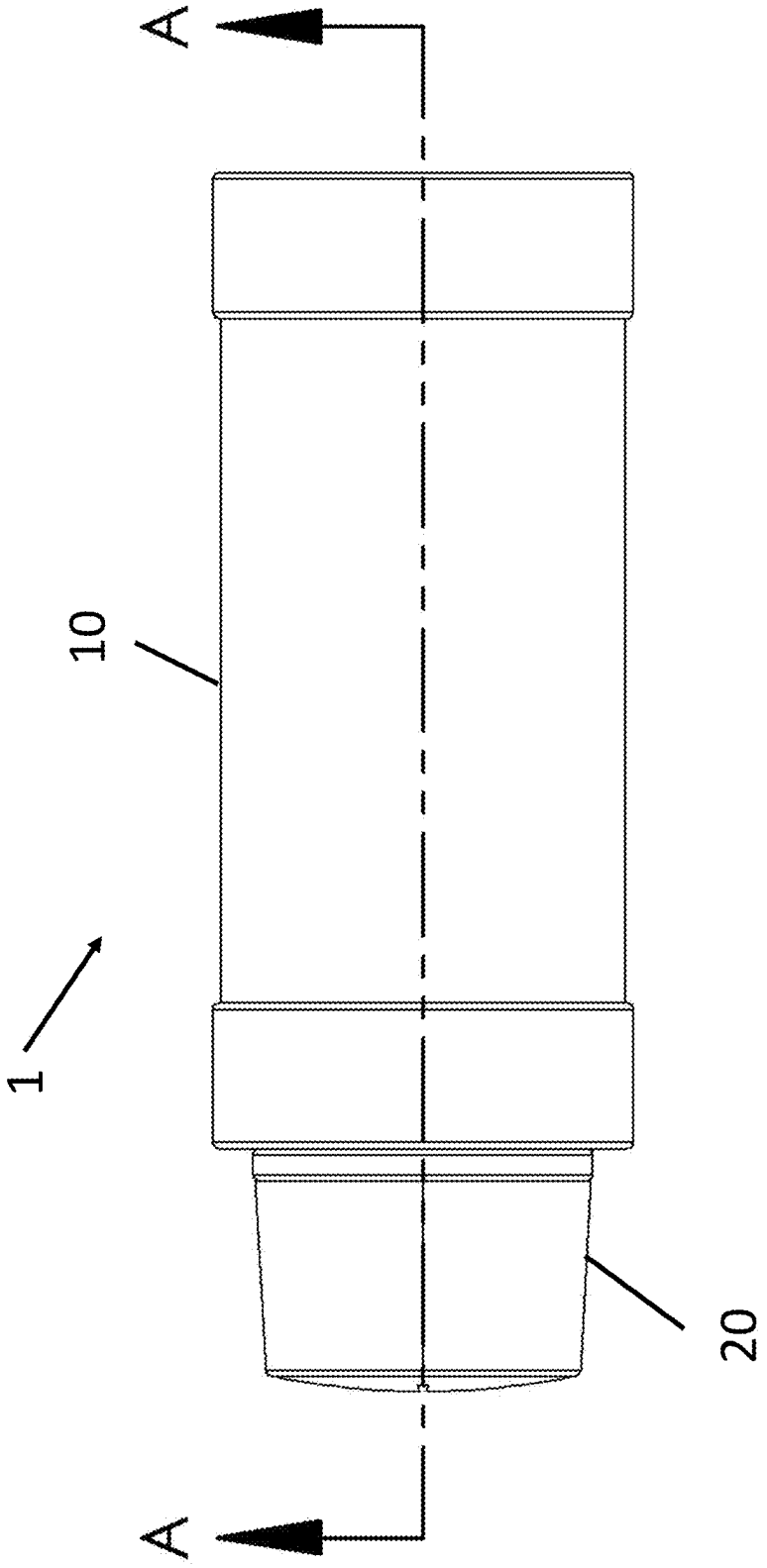


FIG. 1B

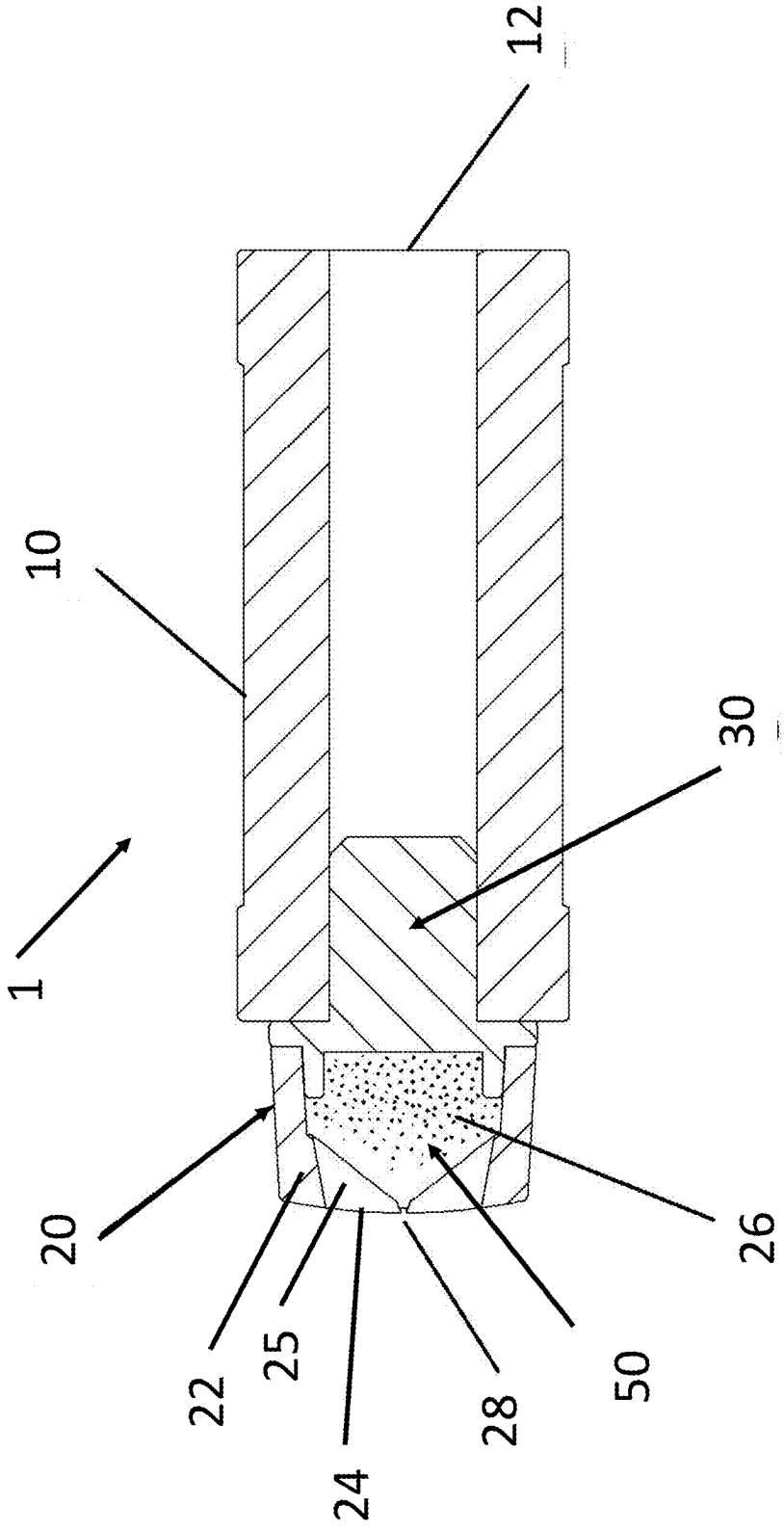


FIG. 1C

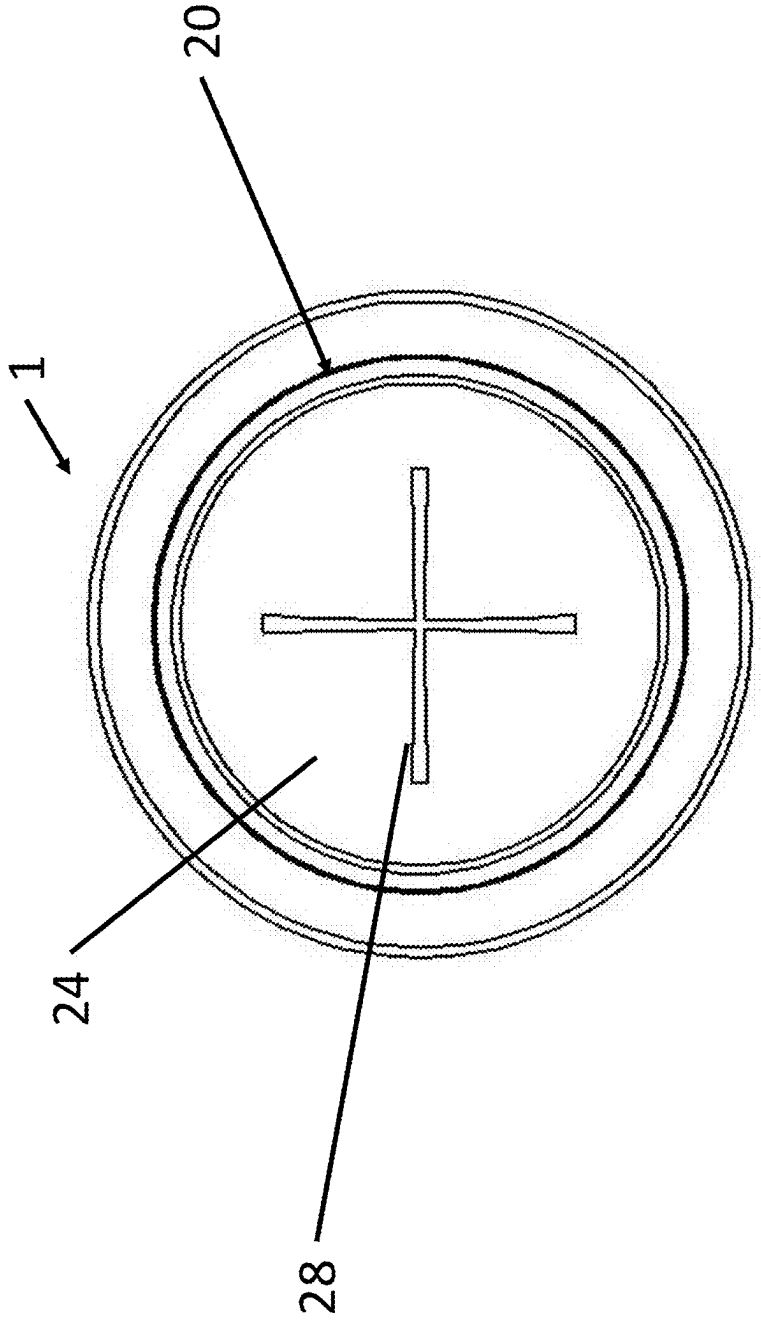


FIG. 1D

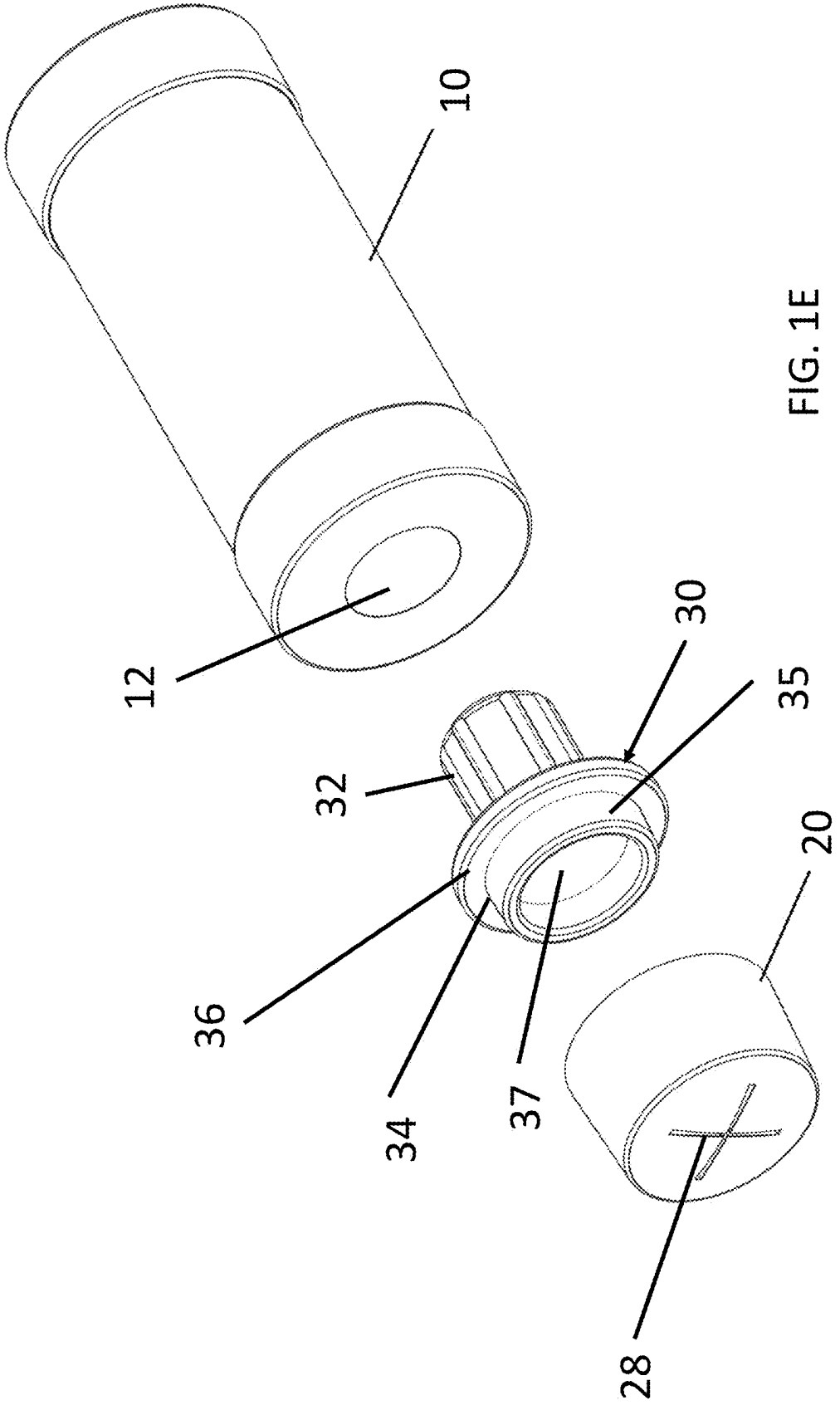


FIG. 1E

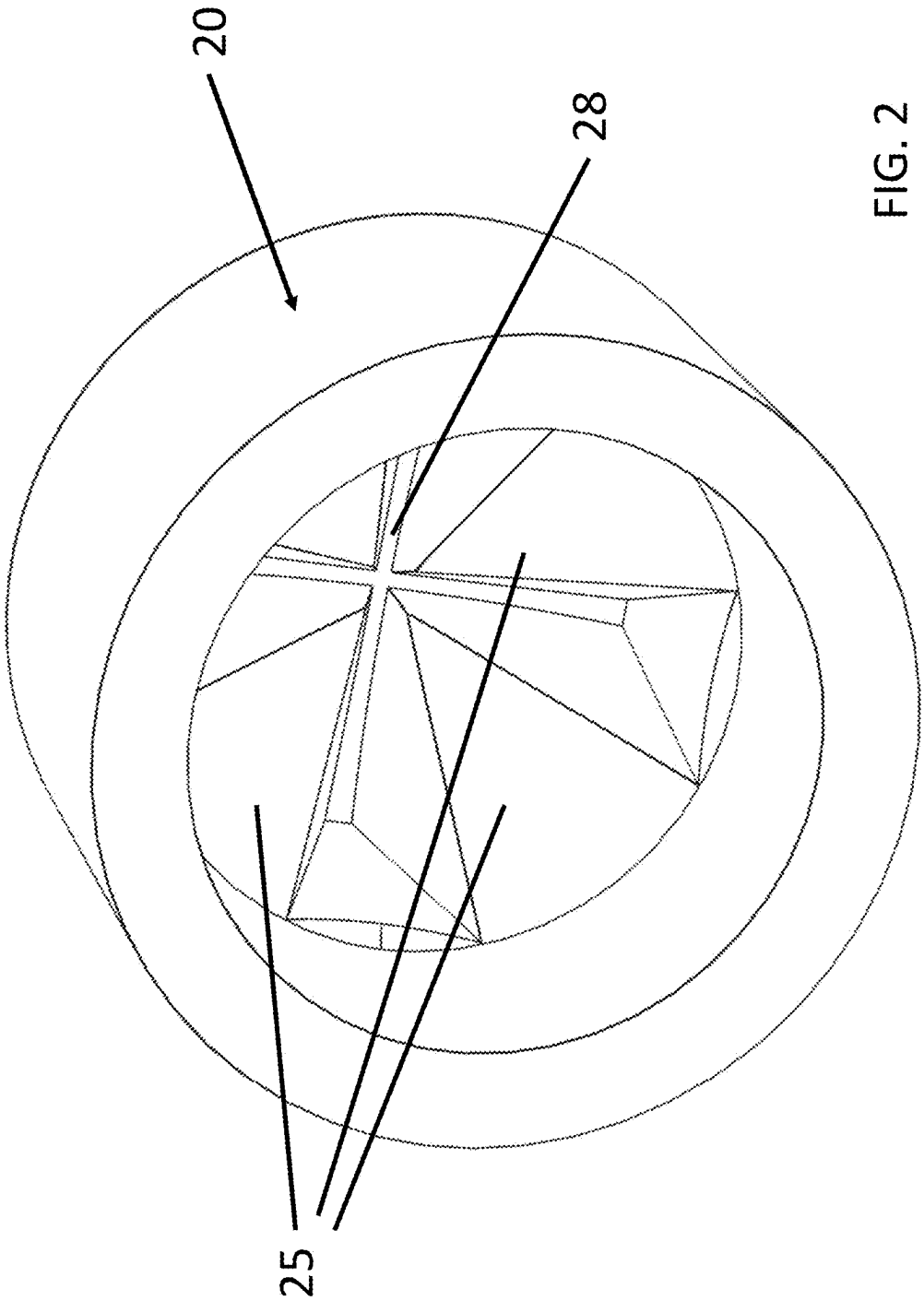


FIG. 2

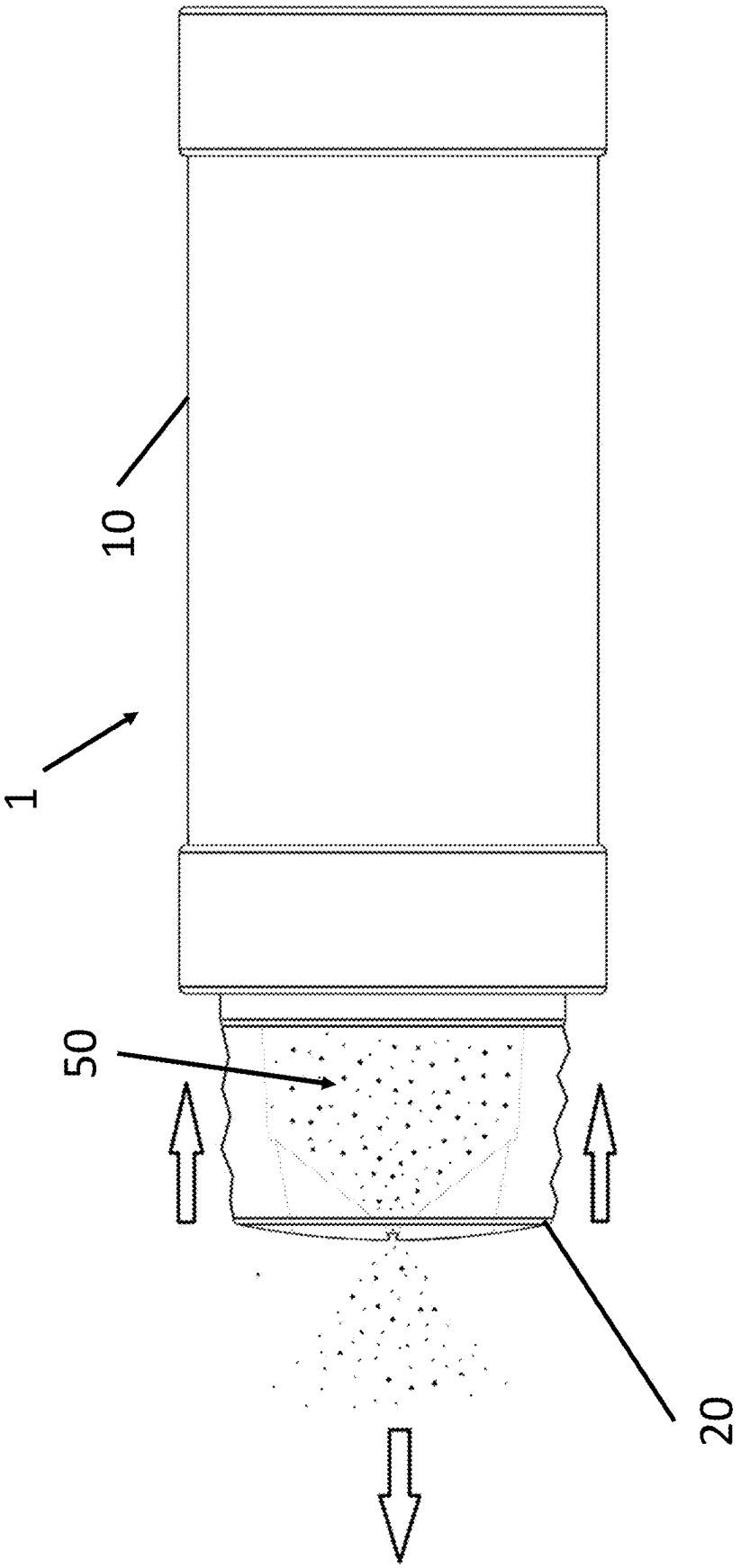


FIG. 3A

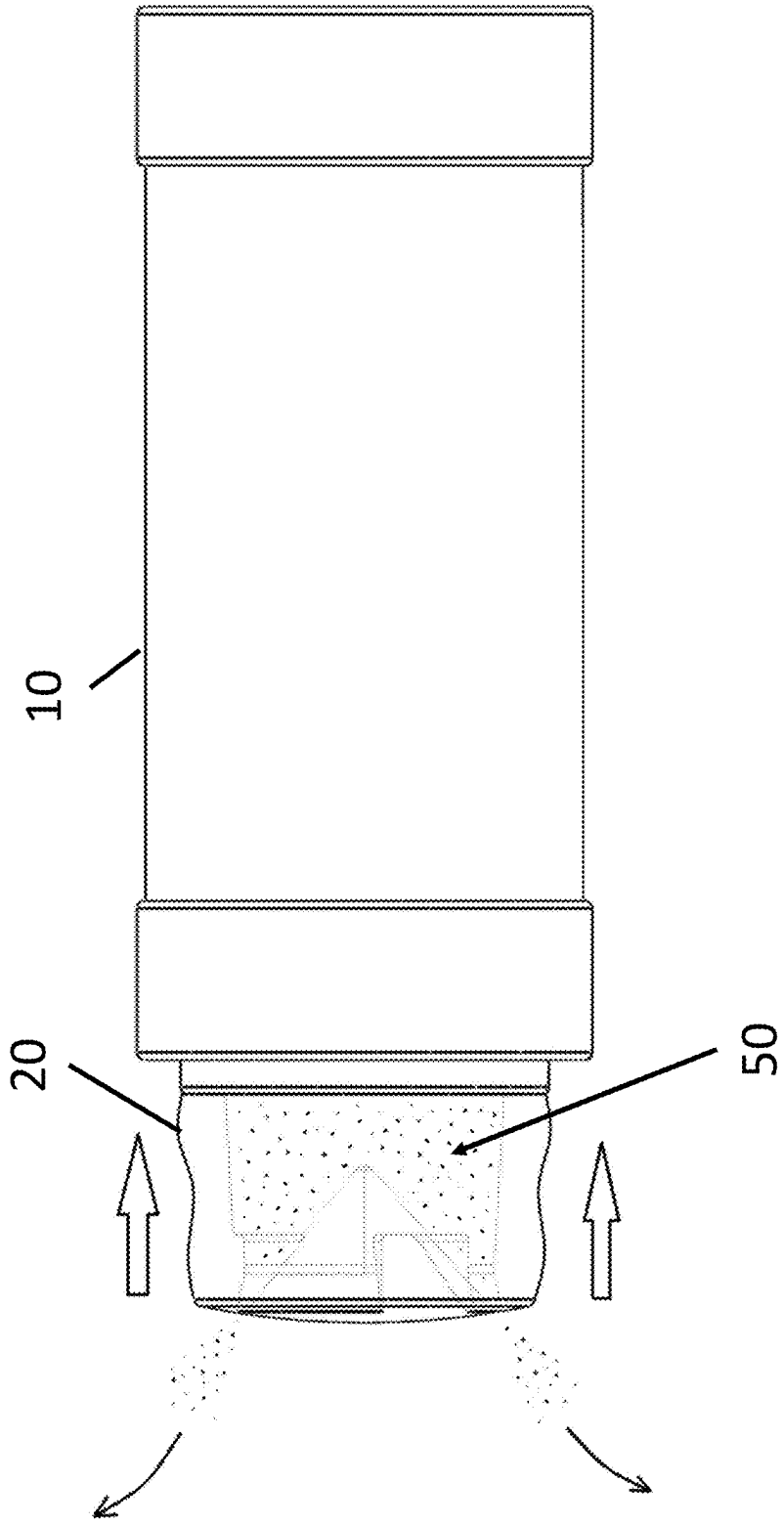


FIG. 3B

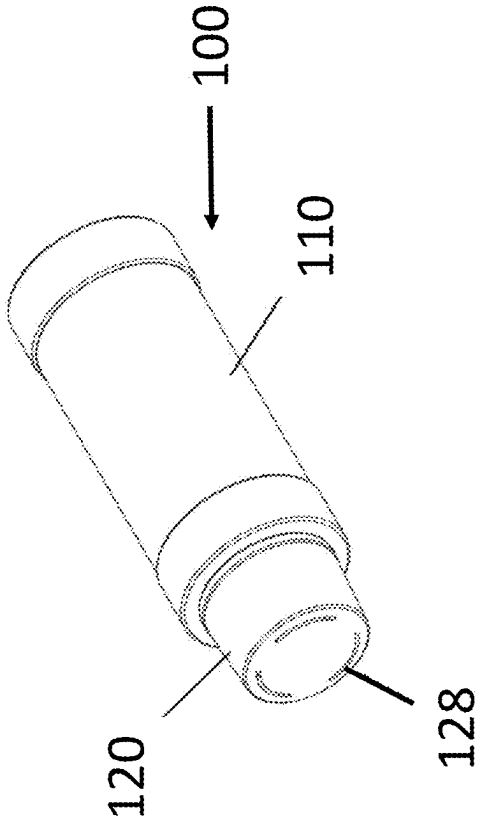


FIG. 4A

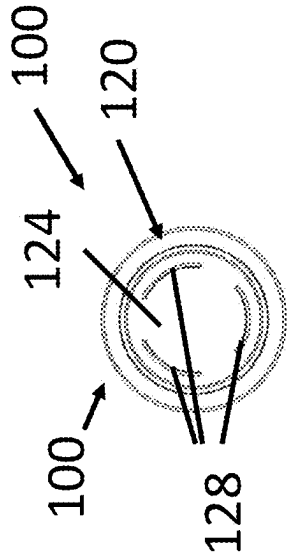


FIG. 4D

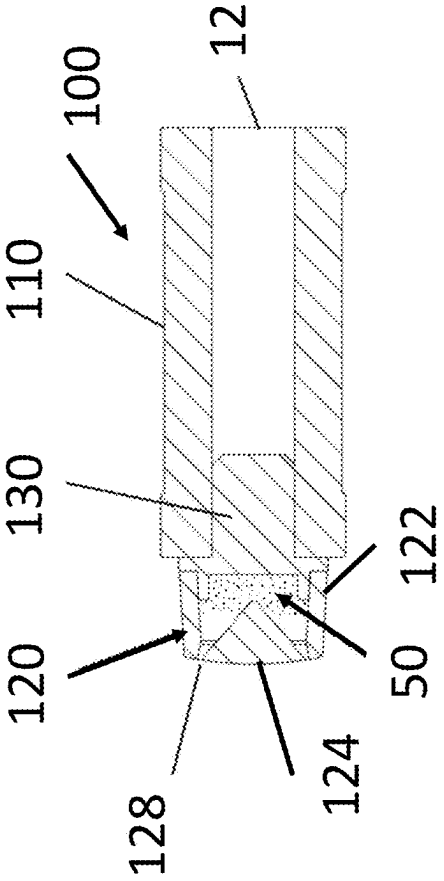


FIG. 4C

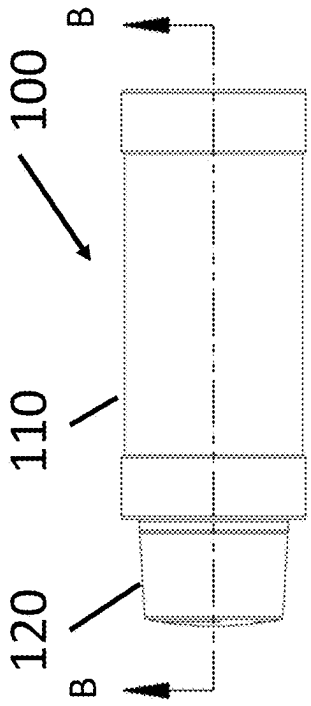


FIG. 4B

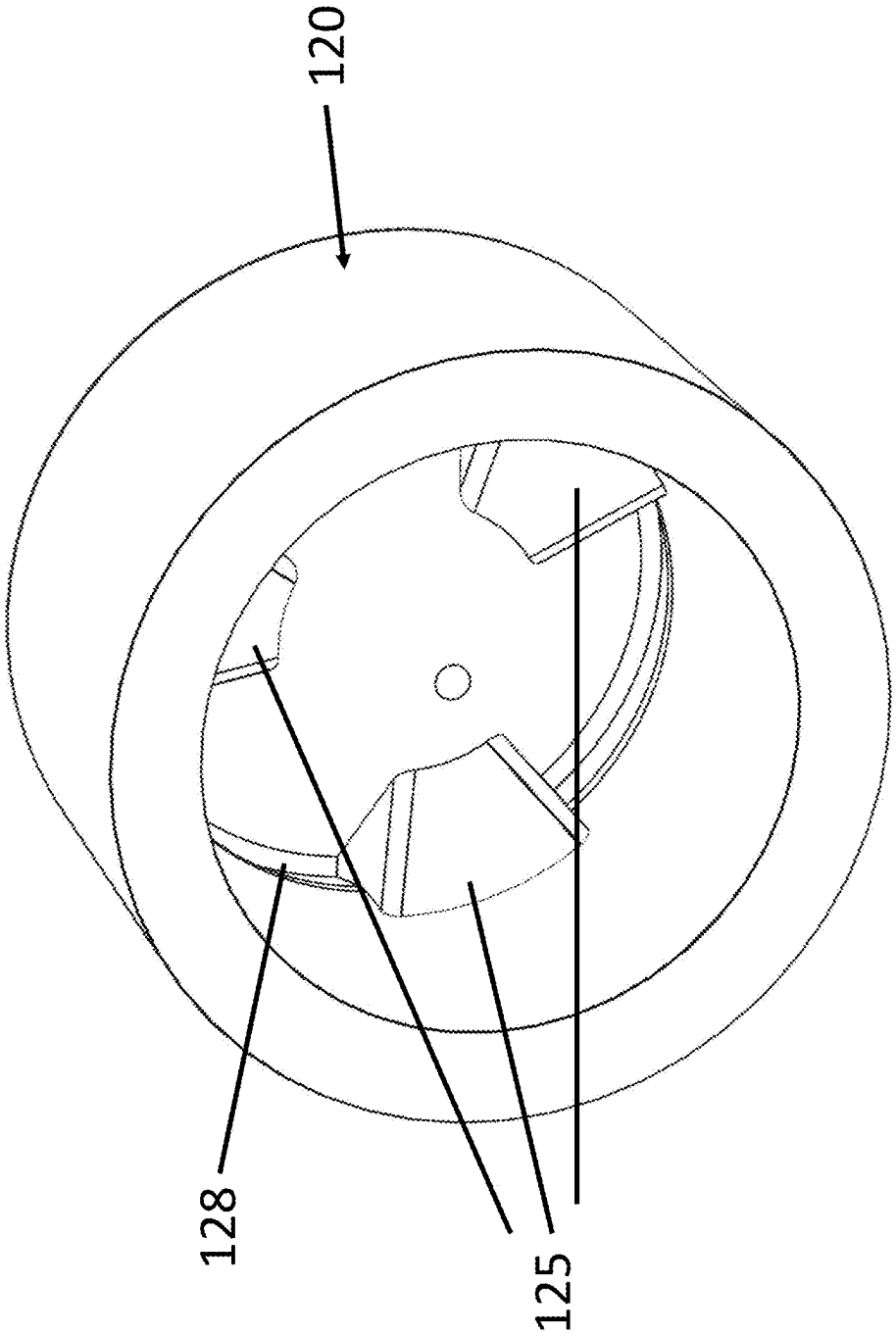


FIG. 5

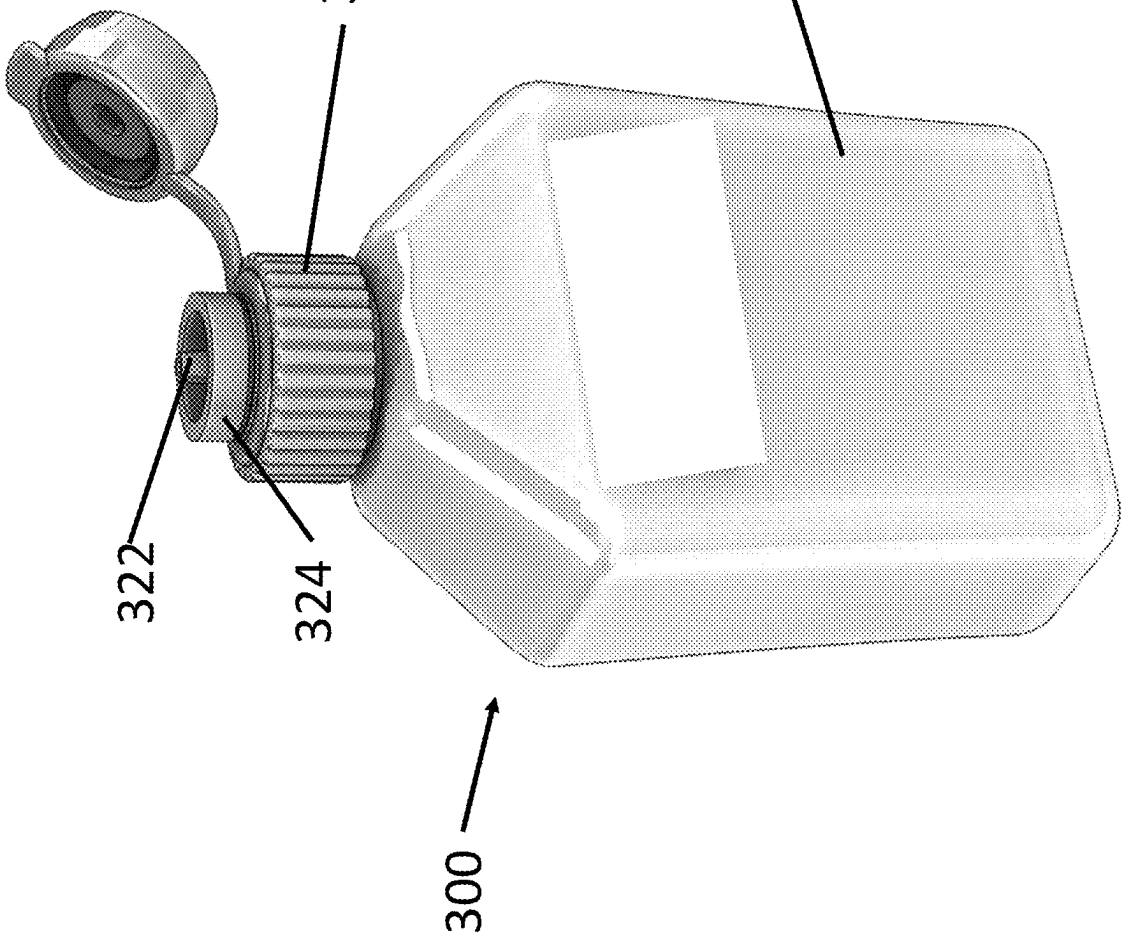


FIG. 6A

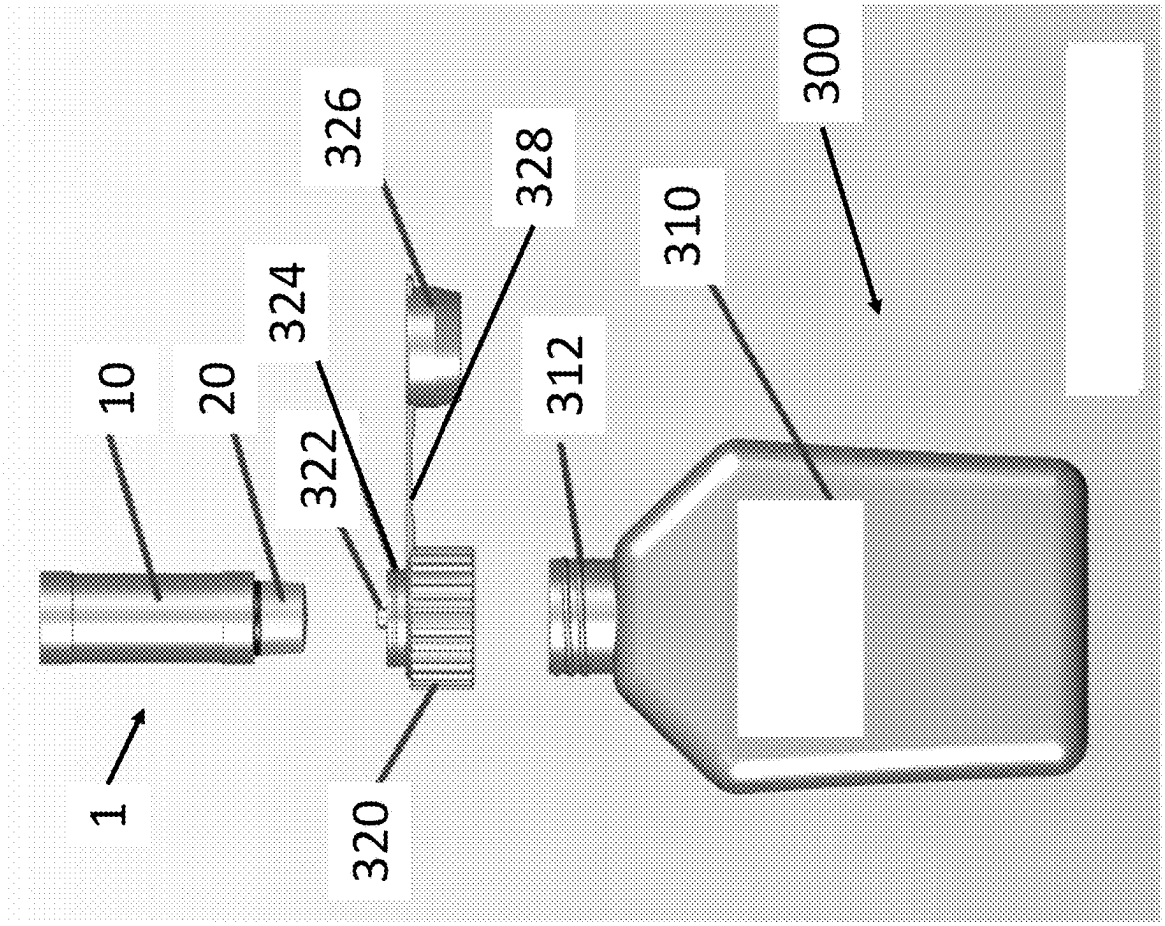


FIG. 6B

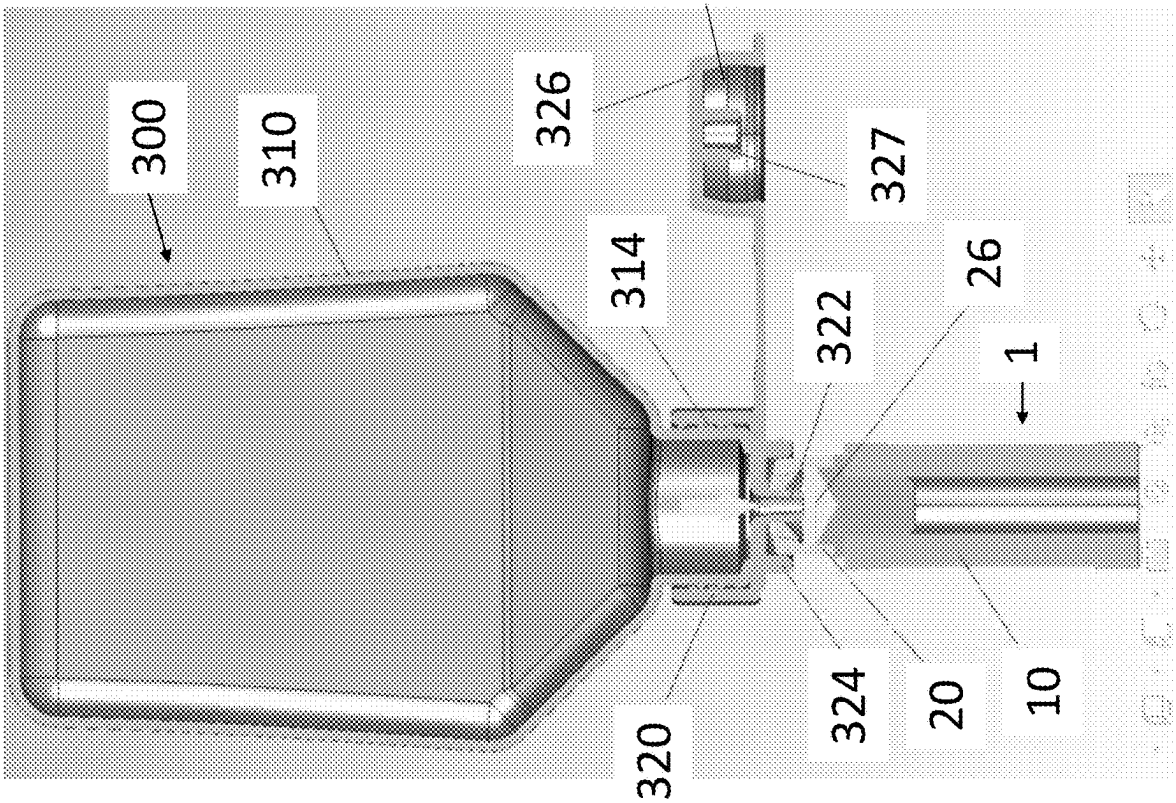


FIG. 7A

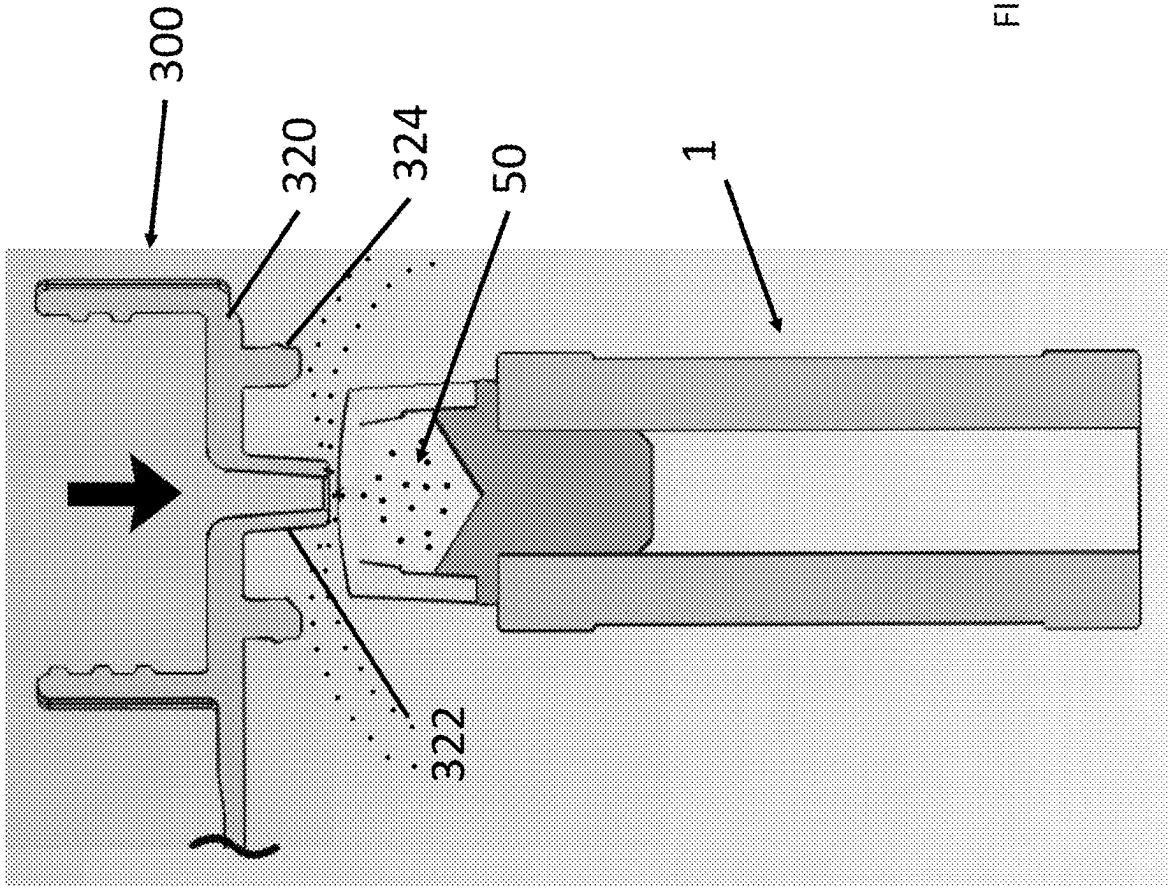


FIG. 7B

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

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

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

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

[0025] FIG. **1**E 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. **3**A and **3**B show operation a toy dart according to an exemplary embodiment of the present invention;

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

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

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

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

[0032] FIG. **4**E 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. **6**A is a perspective view of a bottle according to an exemplary embodiment of the present invention;

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

[0036] FIGS. **7**A and **7**B 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. **1**A-**1**E show of a dart, generally designated by reference number **1**, according to an exemplary embodiment of the present invention, with FIG. **1**C being a cross section view of the dart **1** taken along the line A-A in FIG. **1**B. 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. **1**E, 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. **3**A and **3**B, 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. **4**A-**4**D 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. **6**A and **6**B 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** incudes 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 **325** 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. **7**A and **7**B, 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.

* * * * *