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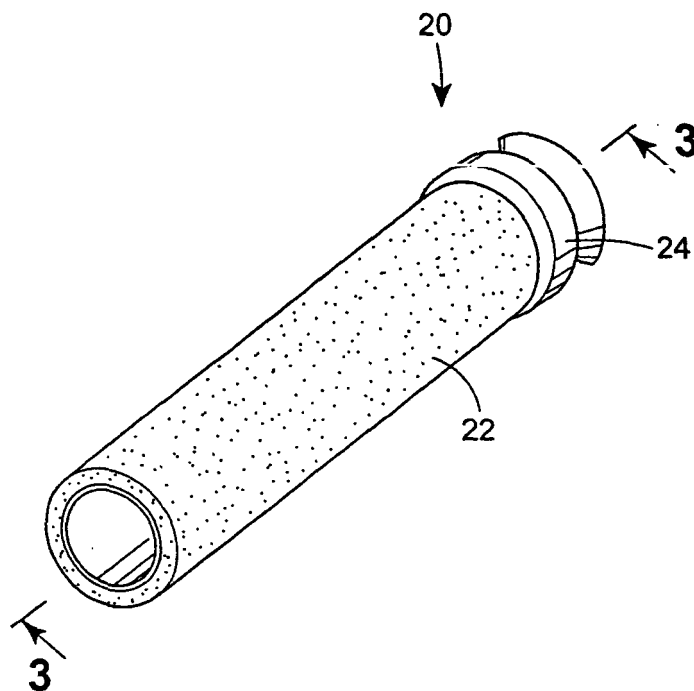
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(54) **Toy projectile**

(57) A toy projectile (20) includes a generally tubular first cylinder (22) having an inner surface and an outer surface, and an integral second cylinder (24). The integral second cylinder (24) includes a first end having a

suction cup (40) and a generally tubular second end having an inner surface and an outer surface. The outer surface of the second end of the second cylinder (24) contacts the inner surface of the first cylinder (22).

FIG. 1



Description

Technical Field

[0001] The present disclosure relates generally to foam projectiles and, more particularly, to foam darts having a foam exterior cylinder and an interior cylinder that is integrally formed with a suction cup and a method of testing the same.

Background of the Disclosure

[0002] Darts for use with toys such as toy guns, toy bows, and the like, are known in the art. For example, United States Patent No. 5,186,156 discloses an air operated toy gun adapted to propel a projectile. The projectile has a shaft with an enlarged head at a forward end of the shaft. A rearward end of the shaft rests at a rearward end of a barrel at a section of a passageway having a reduced diameter relative to the more forward portion of the passageway. The rearward end of the shaft has a circular transverse cross section of a diameter which yields a snug and generally airtight fit within the reduced diameter section. Another reduced diameter section of the passageway serves to prevent the rearward end of the shaft from exiting a rearward opening of the barrel.

[0003] In another example, United States Patent No. 5,535,729 discloses a projectile launcher for launching projectiles. The projectiles are of conventional construction and they preferably each include a generally cylindrical body portion and a suction cup tip portion. Each of the body portions has a rearwardly opening tubular recess formed therein which is adapted to be received over a receiving tube, and each of the cylindrical portions is dimensioned to be received in a launching chamber.

Summary of the Disclosure

[0004] In accordance with one aspect of the disclosure, a toy projectile is disclosed. The toy projectile includes a generally tubular first cylinder having an inner surface and an outer surface, and an integral second cylinder having a first end and a generally tubular second end having an inner surface and an outer surface. The outer surface of the second end of the second cylinder contacts the inner surface of the first cylinder.

[0005] In accordance with another aspect of the disclosure, a toy projectile is disclosed. The toy projectile includes an inner cylinder, and a tip portion integrally formed with the inner cylinder and disposed at a first end of the inner cylinder.

[0006] In accordance with another aspect of the disclosure, a toy projectile is disclosed. The toy projectile includes a generally cylindrical outer cylinder having a first end and a second end, and an insert at least partially disposed in the outer cylinder. The insert includes a suction cup at a first end and an elongate cylindrical section at a second end. The elongate cylindrical section has a

generally constant outer diameter from the first end to the second end of the outer cylinder, when the outer cylinder and the insert are engaged.

[0007] In accordance with another aspect of the disclosure, a method of safety testing a toy projectile is disclosed. The method includes providing an inner cylinder having disposed thereon an outer cylinder, the inner and outer cylinder having first and second ends, and fixedly attaching one of the first and second ends of the toy projectile. The method further includes pulling the other of the first and second ends of the toy projectile to a specified force, and separating the outer cylinder into at least two pieces, such that a first portion of the outer cylinder remains attached to the inner cylinder and a second portion of the outer cylinder is detached from the inner cylinder.

[0008] These and other aspects and features of the disclosure will be more readily understood upon reading the following detailed description when taken in conjunction with the accompanying drawings.

[0009] Fig. 1 is an isometric view of a projectile according to one embodiment of the disclosure;

[0010] Fig. 2 is a side view with hidden lines of the separate parts of the projectile of Fig. 1; and

[0011] Fig. 3 is cross sectional view along line 3-3 of the projectile of Fig. 1;

[0012] Fig. 4 is cross sectional view-of-an alternate embodiment of the projectile of Fig. 1 similar to Fig. 3; and

[0013] Fig. 5 is an isometric view of the projectile of Fig. 1 during a tension test.

[0014] It should be understood that, unless a term is expressly defined in this patent using the sentence "As used herein, the term '_____'" is hereby defined to mean..." or a similar sentence, there is no intent to limit the meaning of that term, either expressly or by implication, beyond its plain or ordinary meaning, and such term should not be interpreted to be limited in scope based on any statement made in any section of this patent (other than the language of the claims). To the extent that any term recited in the claims at the end of this patent is referred to in this patent in a manner consistent with a single meaning, that is done for sake of clarity only so as to not confuse the reader, and it is not intended that such claim term be limited, by implication or otherwise, to that single meaning.

[0015] Referring now to the drawings, and with specific reference to Fig. 1, a toy projectile constructed in accordance with the teachings of the disclosure is generally depicted by reference numeral 20. As shown therein, the projectile 20, in this exemplary embodiment, includes a first or outer cylinder 22 and a second or inner cylinder 24. The toy projectile 20, as disclosed herein, is intended to be used as a dart, arrow, bullet, or other projectile being shot or propelled from a toy compressed air projectile launcher, such as a toy gun, toy bow, and the like. If, by chance, first and second cylinders come apart due to wear, improper handling, etc. the first and second cylinders 22, 24 may be sized so as not pose a choking

hazard to children.

[0016] The outer cylinder 22, as seen in Fig. 2, may be constructed from a lightweight foam material, but may be constructed from any other type of resilient lightweight material that may be engaged by an inner surface of a barrel of a toy projectile launcher (not shown). The outer cylinder 22 has a generally tubular shape including an inner surface 26, an outer surface 28, a front end 30 and a back end 32. A front edge 34 disposed near the front end 30 of the outer cylinder 22 and a back edge 36 disposed near the back end 32 of the outer cylinder 22, are oriented generally parallel to each other and generally perpendicular to a longitudinal axis of the outer cylinder 22.

[0017] The inner cylinder 24, as seen in Fig. 2, may be constructed from a lightweight plastic or elastomeric material, but may be constructed from any other type of semi-rigid to resilient lightweight material. A rear portion 44 of the inner cylinder 24 has a generally tubular shape including an inner surface 37, an outer surface 56, a front portion 38 and the rear portion 39. The front or tip portion 38 may be integrally formed with the inner cylinder 24 proximate a front end of the rear portion 44 and may include a suction cup 40 having an open end extending outwardly from front end 42 of the rear portion 44. The suction cup 40 may have a frusto-conical shape, and may be adapted to temporarily adhere to a generally flat surface once pressed upon, such that the projectile 20 may stick to a wall, door, window, and the like, during use.

[0018] A flange 46 may be disposed proximate intersection of 40 and 44, and may be adapted to engage the front edge 34 of the outer cylinder 22 when the outer cylinder 22 is disposed on the inner cylinder 24. More specifically, as seen in Fig. 3, the front edge 34 of the outer cylinder 22 may abut a rear surface 48 of the flange 46, thereby stopping or retaining the outer cylinder 22. The flange 46 may extend radially outward from a center axis of the inner cylinder 24, and may include a skirt 50 extending from a periphery thereof. An outer diameter of the flange 46 may be greater than an outer diameter of the inner cylinder 22 so the front edge 34 may be disposed within the skirt 50. The skirt 50, as best seen in Fig. 3, may extend rearwardly, or toward the rear portion 44 of the inner cylinder 24, from the periphery of the flange 46, thereby creating an annular groove 52 (Fig-2) between the skirt 50 and the elongate member rear portion 44 of the inner cylinder 24 for retaining or receiving the front end 30 of the outer cylinder 22. The outer surface 56 of the inner cylinder 24 may frictionally engage the inner surface 26 of the outer cylinder 22, or may have glue, epoxy, or other adhesive retentively connecting the inner and outer cylinders 24, 22.

[0019] As such, the inner and outer cylinders 24, 22 in combination and separately are sized and/or shaped to meet safety specification, such as for example, choking hazard specifications set by one or more domestic and international governmental agencies. For example, one of the testing methods, as partially shown in Fig. 5, is a

tension test that pulls the projectile 20 apart to a specified force. In one such tension test the projectile 20 is fixedly attached at one end, such as the tip portion 38, and is then pulled by the outer cylinder 22 until a force of 20 lbf or 88.9N or 88.9 kg*m/s² is reached or until the projectile 20 or the foam cylinder 22 breaks. The choking hazard specifications may further require that the individual pieces of the projectile 20 before and after the tension test meet a size or length requirement. The specification, for example, may require that the one or more pieces of the projectile 20 be each at least 2 inches or 5.08 cm long or longer. Therefore, as seen in Fig. 5, the projectile 20 and, more specifically, the outer foam cylinder 22 may break into two separate pieces, but may both meet the choking hazard specifications as the pieces broken-off piece and the piece still attached to and in combination with the inner cylinder 24, as seen in Fig. 5, may still each be large enough.

[0020] The projectile 20 referenced throughout and the parts thereof may also include variations and/or additions. For example, the outer cylinder 22 may be constructed from a number of materials, including but not limited to, plastic, rubber, fabric, composites, and/or a combination thereof. The shape and size of the projectile 20, including the inner and outer cylinders 24, 22 may also vary depending on the application and structure of the toy (not shown) launching the projectile 20. The inner and outer cylinders 24, 22 may have a generally triangular, square, rectangular, or odd shaped cross-section, and may include additional and/or alternate features. For example, the projectile 20 may include fins (not shown) protruding from the back end of the outer cylinder 22, or may include a rod or post (not shown) extending from the rear portion 44. The rear portion 44 may also have a solid or otherwise filled cavity 54. The inner and outer cylinders 24, 22 may also be reversed, as seen in Fig. 4, wherein the inner cylinder 22 may include an outer cylindrical portion 51 extending from the skirt 50, and may or may not include the rear portion 44 of the inner cylinder 24. Similarly, the tension test specifications may be more or less than 20 lbf, and the size or length requirement may be more or less than 2 inches or 5.08 cm.

[0021] In operation, the toy projectile 20 may be used as a projectile being shot or propelled from a toy, such as a toy gun, toy bow, and the like (not shown). The user may connect the inner and outer cylinders 24, 22 of the projectile 20 by sliding the outer cylinder 22 over the inner cylinder 24 and, more specifically, by sliding the outer cylinder 22 over the inner cylinder 24 such that the inner surface 26 of the outer cylinder abuts an outer surface 56 at the inner cylinder 24 and the front end 30 of the outer cylinder engages the annular groove 52. In the connected position, the inner surface 26 of the outer cylinder may abut a majority of the outer surface 56 of the inner cylinder 24 and, as in this exemplary embodiment, the inner surface 26 of the outer cylinder may abut the entire outer surface 56 of the inner cylinder 24. In the connected

position, the front surface 34 of the outer cylinder 22 may also about the rear surface 48 of the flange 46.

Claims

1. A toy projectile, comprising:-

a generally tubular first cylinder having an inner surface and an outer surface; and
an integral second cylinder having a first end and a generally tubular second end having an inner surface and an outer surface, wherein the outer surface of the second end of the second cylinder contacts the inner surface of the first cylinder.

2. The toy projectile of claim 1, wherein a majority of the outer surface of the second end of the second cylinder contacts the inner surface of the first cylinder.

3. The toy projectile of claim 1 or claim 2, wherein the first end includes a suction cup.

4. The toy projectile of any of the preceding claims, wherein the first cylinder is constructed from a lightweight foam material.

5. The toy projectile of any of the preceding claims, wherein the second cylinder is constructed from a plastic material.

6. The toy projectile of any of the preceding claims, wherein the second end of the second cylinder is substantially flush with a second end of the first cylinder.

7. The toy projectile of any of the preceding claims, wherein the second end of the second cylinder is hollow.

8. The toy projectile of any of the preceding claims, further including a flange extending radially outward between the first and second ends of the second cylinder, the flange being adapted to contact a first end of the first cylinder.

9. The toy projectile of claim 8, further including a skirt extending rearwardly from a periphery of the flange, such that an inner surface of the skirt contacts the outer surface of the first cylinder.

10. The toy projectile of any of the preceding claims, wherein the first and second cylinders are each at least 2 inches (5.08cm) long.

11. A toy projectile, comprising:

an inner cylinder; and
a tip portion integrally formed with the inner cylinder and disposed at a first end of the inner cylinder.

12. The toy projectile of claim 11, further including an outer cylinder disposed on the inner cylinder.

13. The toy projectile of claim 12, wherein the inner cylinder includes an outer surface the majority of which contacts an inner surface of the outer cylinder.

14. The toy projectile of any of claims 11 to 13, wherein the tip portion includes a suction cup.

15. The toy projectile of at least claim 12, wherein the outer cylinder is constructed from a lightweight foam material.

16. The toy projectile of any of claims 11 to 15, wherein the inner cylinder is constructed from a plastic material.

17. The toy projectile of any of claims 11 to 16, wherein the inner cylinder is hollow.

18. The toy projectile of any of claims 11 to 17, further including a flange extending radially outward from the inner cylinder.

19. The toy projectile of claim 18, further including a skirt extending rearwardly from a periphery of the flange.

20. The toy projectile of at least claim 12, wherein the inner and outer cylinders are each at least 2 inches (5.08cm) long.

21. A method of safety testing a toy projectile comprising:

providing an inner cylinder having disposed thereon an outercylinder, the inner and outer cylinder having first and second ends;
fixedly attaching one of the first and second ends of the toy projectile;
pulling the other of the first and second ends of the toy projectile to a specified force; and
separating the outer cylinder into at least two pieces, such that a first portion of the outer cylinder remains attached to the inner cylinder and a second portion of the outer cylinder is detached from the inner cylinder.

FIG. 1

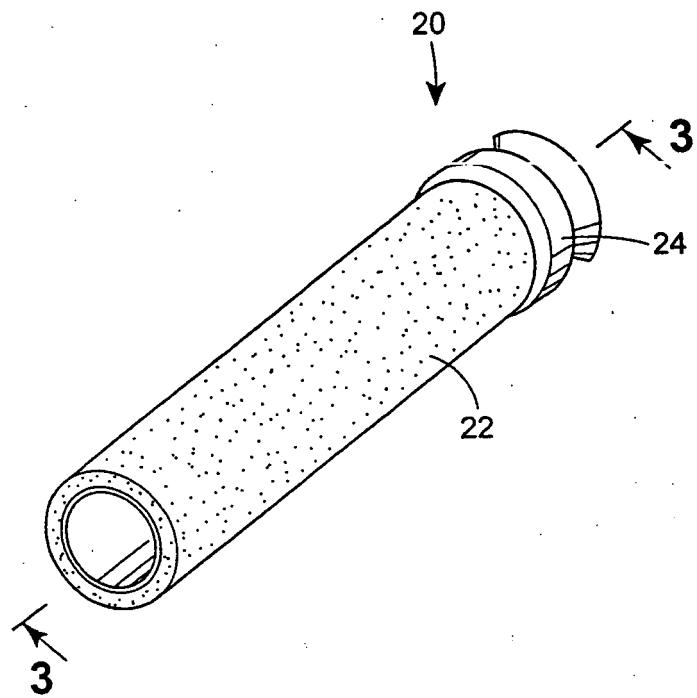


FIG. 2

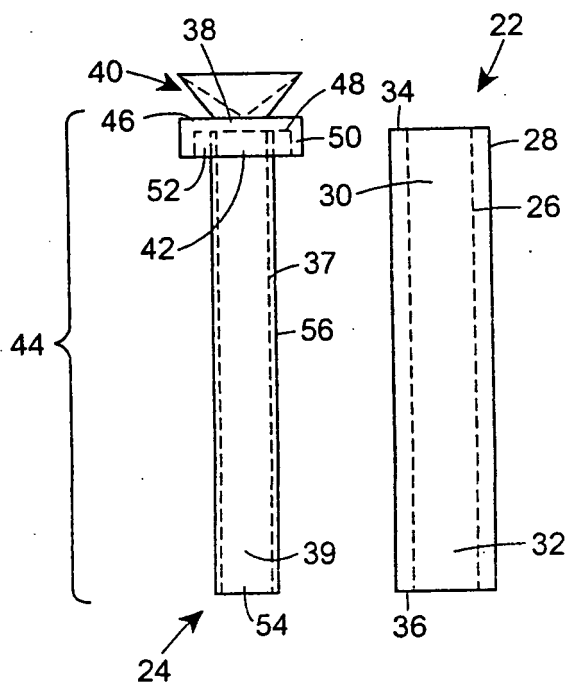


FIG. 3

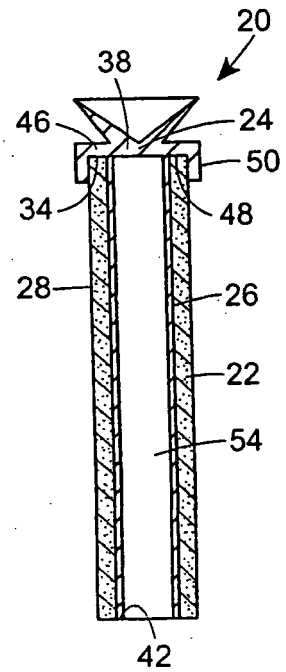


FIG. 4

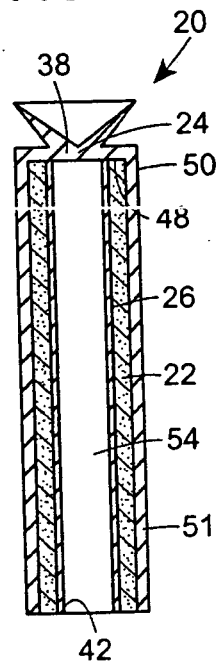


FIG. 5

