A lead free, frangible air gun BB constituted from metal particles which may be mixed with a non-toxic flow agent and method of making an air gun BB are disclosed, wherein air gun BB placed therein will, when shot at a minimum distance of ten meters, will
breakup into small pieces when striking a hard surface such as a rock, a metal plate and a concrete wall. The muzzle velocity will be less than five hundred feet per second needed to initiate the breaking up of the air gun BB striking a hard surface at a minimum distance of ten meters.
A lead free frangible air gun BB and method of making same

ABSTRACT

A lead free, frangible air gun BB constituted from metal particles which may be mixed with a non-toxic flow agent and method of making an air gun BB are disclosed, wherein air gun BB placed therein will, when shot at a minimum distance of ten meters, will breakup into small pieces when striking a hard surface such as a rock, a metal plate and a concrete wall. The muzzle velocity will be less than five hundred feet per second needed to initiate the breaking up of the air gun BB striking a hard surface at a minimum distance of ten meters.

DESCRIPTION

• Field of the invention

This invention relates to an air gun BB that is lead free and frangible.

• Description of the Previously Published Art
A lead free frangible air gun BB and method of making same

ABSTRACT

A lead free, frangible air gun BB constituted from metal particles which may be mixed with a non-toxic flow agent and method of making an air gun BB are disclosed, wherein air gun BB placed therein will, when shot at a minimum distance of ten meters, will breakup into small pieces when striking a hard surface such as a rock, a metal plate and a concrete wall. The muzzle velocity will be less than five hundred feet per second needed to initiate the breaking up of the air gun BB striking a hard surface at a minimum distance of ten meters.

DESCRIPTION

- Field of the invention

This invention relates to an air gun BB that is lead free and frangible.

- Description of the Previously Published Art
It is desirable to manufacture lead free, frangible air gun BBs having muzzle velocities of less than five hundred feet per second that breaks apart into small pieces when striking a hard surface such as a rock, a steel plate and a concrete wall at a distance of at least ten meters. The air gun BB must have enough integrity in its composition that it does not break apart while passing through the barrel of an air gun.

Currently, lead free air gun BBs are constructed out of iron, steel or lead plated with zinc or copper resulting in some of these types of BBs to ricochet back towards the shooter when striking a hard surface such as a rock, a steel plate and a concrete wall at a distance of at least ten meters. Lead BBs may expose the shooter to high levels of lead if the shooting area is not properly ventilated. Young shooters have the tendency to place BBs in their mouths, and if lead BBs are swallowed, lead poisoning may result.

OBJECT OF THE INVENTION

It is the object of this invention to provide a lead free, frangible air gun BB that breaks apart into small pieces when striking a hard surface such as a rock, a steel plate and a concrete wall at a distance of ten meters or more having an initial muzzle velocity of less than five hundred feet per second constructed from metal particles and swaged to a desired hardness using a suitable die known in the arts.
SUMMARY OF THE INVENTION

The foregoing and further objects and advantages are obtained by manufacturing a lead free, frangible air gun BB suitable for air rifles, air pistols and BB guns from metal particles, swaging or compressing a measured amount of metal particles to a desired hardness using a suitable die known in the arts.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The current invention achieves the desired results by constructing lead free frangible air gun BBs out of metal particles. The metal particles may be from one type of metal or a combination of particles of various metal types. Metal particles such as copper, bronze, brass, tin, zinc, iron, steel, tungsten, tungsten carbide, ferrotungsten, aluminum and bismuth are examples of suitable metal particles. The metal particles may be a powder, granules, flakes, chips, other compactable particulate forms or a combination thereof.

The metal particles may be mixed with a suitable non-toxic flow agent and mixed until a homogenous mixture is obtained. The amount of flow agent added to the metal particles will depend on the preferred rate of flow the mixture requires for maximum production rate efficiency and also the desired frangibility of the air gun BB. An addition of .2% of flow agent is a good starting point.
A pre-measured amount of the homogenous mixture is placed inside a suitable die having the desired dimensions. The homogenous mixture is then swaged inside the die using corresponding internal and external punches. One or more dies may be used in the swaging process. A single stage press may be used or a press have multiple dies may also be used. A rotary tablet press is an example of a multiple die press. It is recommended that a rotary type press be used if a high rate of production is desired.

The minimum diameter of the preferred embodiment will be 4.3 MM or .171 of an inch and the maximum diameter of the preferred embodiment will be 4.4 MM or .173 of an inch.

The air gun BB may have the shape of a conventional copper or zinc plated iron BB or may have a solid band around its centre with a rounded top and bottom.

If a harder BB is desired, the swaged BB may be sintered by processes known to the arts.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention will be further described with reference to the accompanying drawings.

FIG 1 illustrates the air gun BB having a typical round shape and composed of a single metal powder.

FIG 2 illustrates the air gun BB having a solid band around its centre with a rounded profile on top and bottom of the solid band of the air gun BB.
DETAILED DESCRIPTION OF THE DRAWINGS

In FIG 1, the air gun BB composed of a single metal powder is illustrated by (1).

In FIG 2, the air gun BB composed of two metal powders is illustrated by (1) and (2). An example of a solid band around the centre of the BB is illustrated by (3). The round sections on the top and bottom of the solid band is illustrated by (4) and (5).

CLAIMS

1) A lead free, air gun BB comprising of metal particles blended together in a homogenous mixture.

2) The air gun BB according to claim 1, wherein said particles comprise any one or more of the metals selected from the group consisting of copper, bronze, brass, tin, zinc, iron, steel, tungsten, tungsten carbide, ferrotungsten, aluminum and bismuth.

3) The air gun BB according to claim 1, wherein the metals particles are in the form of powder, granules, flakes, chips other compactable particulate forms or a combination thereof.

4) The air gun BB according to claim 1, wherein a non-toxic flow agent may be added to the metal particles to increase flow rate and frangibility.
DETAILED DESCRIPTION OF THE DRAWINGS

In FIG 1, the air gun BB composed of a single metal powder is illustrated by (1).

In FIG 2, the air gun BB composed of two metal powders is illustrated by (1) and (2). An example of a solid band around the centre of the BB is illustrated by (3). The round sections on the top and bottom of the solid band is illustrated by (4) and (5).

CLAIMS

1) A lead free, air gun BB comprising of metal particles blended together in a homogenous mixture.

2) The air gun BB according to claim 1, wherein said particles comprise any one or more of the metals selected from the group consisting of copper, bronze, brass, tin, zinc, iron, steel, tungsten, tungsten carbide, ferrotungsten, aluminum and bismuth.

3) The air gun BB according to claim 1, wherein the metals particles are in the form of powder, granules, flakes, chips other compactable particulate forms or a combination thereof.

4) The air gun BB according to claim 1, wherein a non-toxic flow agent may be added to the metal particles to increase flow rate and frangibility.
5) The airgun BB according to claim 1, wherein the air gun BB having an initial muzzle velocity of less than five hundred feet per second will break into small particles when striking a hard surface such as a rock, a metal plate or concrete at a distance of least ten meters.

6) A method of manufacturing a lead free, frangible air gun BB comprising the steps of:

blending the metal particles into a homogeneous mixture

swaging the homogenous mixture in a swaging die to form a swaged air gun BB

7) The method according to claim 6, wherein the swaged air gun BB may be sintered in order to increase the rigidity of the air gun BB if required.