

1

2,831,778

TARGET COMPOSITION

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This invention relates to frangible targets of the type adapted to be projected from target throwing traps and broken in flight by the impact of shot pellets.

The object of this invention is an improvement in target compositions which enables their production at reduced cost.

The targets commonly used in the sports of trap and skeet shooting are of saucer shape, having a diameter of about 4 1/4" and an over-all depth of about 1". They comprise a substantially cylindrical rim portion and a domed or arched mid-portion extending upwardly and inwardly from the rim. It is essential that they possess sufficient mechanical strength to withstand the stresses and shocks incident to commercial shipment and handling to and delivery from a throwing trap, and at the same time be sufficiently fragile to be shattered when impacted by one or two No. 9 shot. They must have sufficient weight for stability in flight, but excessive weight is undesirable. A typical commercial target has a weight of about 100 grams, a bulk density of about 1.9 grams per cubic centimeter, and a crushing strength not over 45 pounds against a compressive force applied at opposite sides of the dome immediately above the rim. Such targets are commercially manufactured from asphaltic material, such as coal tar pitch, having a melting point between about 260° F. and 280° F., and a filler of an earthy material, such as clay or ground limestone. To secure the requisite properties it has hitherto been deemed essential that the composition comprise not less than about 45% of pitch and not over about 55% of limestone or clay. A larger percentage of the earthy material results in targets which are too hard to be broken by the impact of a few shot. Since the targets are destroyed in the using, it is desirable that their cost be kept at a minimum. The cost of the pitch is several times that of the earthy constituent. The present invention comprises the discovery of a composition in which the content of earthy material can be substantially increased and the cost of the targets proportionately reduced.

It has been found that the addition of a few percent of a paraffinic oil enables the use of increased proportions of the earthy material with a corresponding reduction in the content of high cost pitch. Certain types of crude oil are suitable for this purpose. However, the preferred addition is a petroleum distillation residue of

2

the type commercially known as residual oil No. 6. This oil has a specific gravity (API) at 60° F. of 16.7, a flash point of 226° C., and a pour point (ASTM) of 10° F. The addition of such an oil to a target composition in amounts up to about 5% enables an increase in the earthy constituent of the composition, say ground limestone, from 54% to a minimum of 60% and a maximum of not less than 66%. For example, excellent targets can be made from a composition comprising 62.5% of limestone, 35% of pitch, and 2.5% of residual oil No. 6. The range of coal tar pitch is from 30% to 35%. These targets have an average weight of 103 grams, an average crushing strength of 40 pounds, and a bulk density of 1.95 grams per cubic centimeter. The amount of paraffinic oil which can be added is limited by the softening of the targets under high temperature storage, the practical upper limit being about 5%. Quantities of oil substantially less than about 1% are ineffective. Variations in the composition are permissible or even necessary, one factor being the granulation of the limestone. An excess of fine material tends to produce targets which are too dense and strong. To compensate for this, and for other reasons, a few percent of a low density bulking material may be added, typical materials being diatomaceous earth, sawdust, or perlite, an expanded hydrous obsidian. To maintain the requisite properties of trapping strength, frangibility under impact, and the like, the amount of such addition should not exceed about 5%.

It will be seen that by the practice of the invention, namely the use in a target composition of up to about 5% of a paraffinic oil, the cost of expendable targets has been substantially reduced.

What is claimed is:

1. A frangible substantially saucer-shaped projectable target consisting essentially of a composition of 60% to 66% ground limestone, 30% to 35% coal tar pitch having a melting point between about 260° F. and 280° F., and 1% to 5% of a paraffinic oil having a specific gravity at 60° F. of about 16.7 and a pour point of about 10° F.

2. A frangible substantially saucer-shaped projectable target consisting essentially of a composition of 60% to 66% limestone, 30% to 35% coal tar pitch having a melting point between about 260° F. and 280° F., and 1% to 5% paraffinic oil.

3. A frangible substantially saucer-shaped projectable target consisting essentially of a mixture of ground limestone, an asphaltic binder having a melting point between about 260° F. and 280° F., between 1% and 5% of the weight of the target of paraffinic oil and up to 5% of the weight of the target of perlite.

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