

C. C. WAIS.
BALL AND METHOD OF MAKING THE SAME.
APPLICATION FILED JULY 30, 1917.

1,339,992.

Patented May 11, 1920.

Fig. 1.

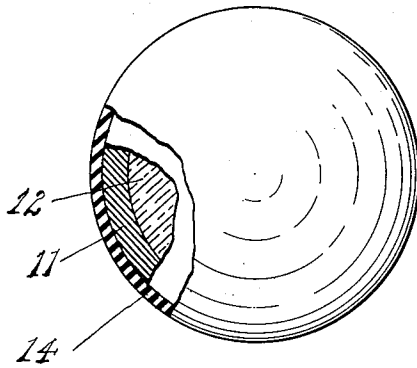
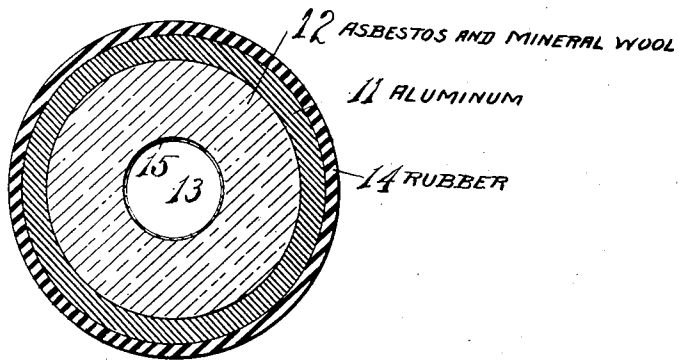


Fig. 2.



Inventor:
Charles C. Wais,
by B. H. Herbst
His Attorney.

UNITED STATES PATENT OFFICE.

CHARLES C. WAIS, OF CINCINNATI, OHIO.

BALL AND METHOD OF MAKING THE SAME.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES C. WAIS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Balls and Methods of Making the Same, of which the following is a specification.

My invention relates to balls, of the character of those used in playing the game of billiards or pocket billiards, or other similar games, in which contact is made between balls, the course of a ball or balls being determined by the force and direction of the impact between the balls.

Balls of this character have heretofore been usually made of ivory, ivory suitable for the purpose being however quite scarce and expensive.

It is the object of my invention to provide a ball made of different materials and so constructed and arranged as to have the properties of the ivory balls, and to provide a ball which is economical in manufacture, and to provide a new and improved method of making the same.

It is a further object of my invention to provide a ball of the character mentioned of concentric layers of different materials coating to produce a ball having resilient properties and a hard surface of such character as to produce a clicking sound on impact between balls, similar to the clicking sound made by impact between usual ivory billiard balls, and, further, to produce a ball composed of concentric layers of material of such character that the greatest weight of the material, or material of greatest specific gravity, shall be near but slightly spaced from the outer periphery of the sphere of the ball, the outer periphery of the sphere being on the surface of a hard resilient layer or cover of the ball, and it is a further object of my invention to so distribute the weight of the materials and to provide and arrange the materials in such manner that a finished ball of the size of the present billiard balls in general use shall be of a weight substantially like the weight of said present billiard balls.

The invention will be further readily understood from the following description and claims, and from the drawing, in which latter:

Figure 1 is a side elevation of a ball em-

bodiment of my invention, and partly broken away to expose its layers of material.

Fig. 2 is a central cross-section of the same.

The ball of my invention comprises a main shell 11, which is preferably of metal, and may be instanced as composed of aluminum having a slight percentage of copper incorporated therein, for instance, an eight per cent. copper mixture with aluminum. This shell is preferably a complete sphere and is preferably made of cast metal.

In the shell there is a filler 12, which is rigid with the shell, and is preferably of a mineral substance, and may be instanced as asbestos fluxed by heat with borax or mineral wool fluxed by heat with alum, and solidified by cooling, and preferably is of a substantially vitreous substance. The filler may have a cavity 13 at the center of the ball, this cavity being preferably of a size so that the finished ball will have a weight similar to the weight of a billiard ball of ivory of the same size. The cavity may however be dispensed with, it being the purpose of my invention to so select the materials and their proportions as to provide a ball of the size and weight of a usual billiard ball which is as near a solid as possible.

The shell is covered with a covering of hard resilient substance, preferably a vegetable substance, for instance, with hard vulcanized rubber, as exemplified by the spherical cover 14.

In making the ball, the shell which is preferably of cast material, may be cast with one or more apertures, through which the filling material is received in the shell, the aperture in the filling material being suitably formed, as about a suitable thin sphere of suitable material, suitably centrally supported within the shell, and the aperture or apertures in the shell then filled with metal, for instance cast metal similar to the metal of the shell. Or, if desired, the shell may be cast about the filler, the filler being first made with its cavity therein, when the cavity is employed. The cavity may be of suitable size, or, if desired, entirely dispensed with.

After the shell and filler have been associated, the shell is preferably compressed by being pressed, for instance, in a suitable press between suitable dies having part-

spherical cavities, so as to compress the cast metal for reducing its outer dimensions and to firmly press the same upon the filler.

After compression of the shell it is suitably treated for receiving the rubber covering, as by being dipped in liquid sulfur. The cover is then applied to the shell. This cover is preferably of rubber, applied in flexible sheet form of suitable thickness to form a concentric layer about the shell. The covering is thereupon vulcanized in place on the shell for forming the comparatively hard resilient cover for the shell, the treatment of the metal shell enabling firm adhesion of the cover to the shell. The rubber is suitably colored or treated for giving the vulcanized covering suitable colors to correspond to the usual colors of balls used in the game of billiards or pocket billiards.

After the cover has been hardened, the outer surface of the ball may be surfaced, as by suitably grinding and polishing the same.

My improved ball is a ball which has resilient properties and weight similar to the resilient properties and weight of a given size of the usual billiard ball, the cover of the ball acting in conjunction with the heavier shell to give the ball resilience, and the heavier shell arranged adjacent to the outer peripheral surface of the sphere of the ball for locating the principal inertia of motion of the ball adjacent to but slightly removed from said outer surface. The impact between balls is transmitted through the hard resilient cover to the metal shell, and thence to the filler. My improved ball responds quickly to impacts and retains inertia of motion imparted thereto for a considerable period for providing a ball with excellent rolling properties.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A ball of the character described comprising a metal shell adjacent to the outer surface of the ball, a vitreous filler in said shell, and a hard resilient cover about said shell.

2. A ball of the character described comprising a metal shell of substantial thickness adjacent to the outer surface of the ball, a hard resilient cover of less thickness about said shell, and a hard vitreous filler of greater thickness than said shell in said

shell, the proximate surfaces of said shell, said cover, and said filler being nearer to the outer surface of said ball than they are to the center of said ball.

3. A ball of the character described comprising a rigid shell, a hard resilient cover therefor having firm adhesion to said shell, and a vitreous filler in said shell, the proximate surfaces of said shell and said filler firmly united, the material of said shell having greater specific gravity than the specific gravities of the materials of said cover and said filler, and the proximate surfaces of said shell, said cover and said filler being closer to the outer surfaces of said ball than they are to the center of said ball.

4. A ball of the character described comprising a mineral filler, a cast metal shell compressed on the mineral filler, and a vegetable cover rigid with the shell hardened on said shell.

5. A ball of the character described comprising a mineral filler solidified by heat and having a central cavity, a metal shell compressed on the filler, and a vegetable cover rigid with the shell.

6. The method of forming a ball of the character described, which consists in providing a metal shell about a vitreous filler, compressing said metal shell about the vitreous filler, and providing the compressed shell with a resilient cover.

7. The method of forming a ball of the character described, which consists in providing a cast metal shell and a vitreous filler for said shell formed of material fluxed by heat and solidified into a vitreous substance, compressing said shell upon said vitreous filler, and providing the shell with a covering, and hardening said covering on said shell.

8. The method of forming a ball of the character described, which consists in providing a cast metal shell and a vitreous mineral filler therefor, compressing said shell upon said vitreous filler, covering said shell with a flexible cover of rubber and hard vulcanizing said rubber cover, and then surfacing said cover.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES C. WAIS.

Witnesses:

MAURICE STEINBERG,
THERESA M. SILBER.