BALL-STRIKING IMPLEMENT

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This invention relates to a construction for ball-striking implements. More particularly, it relates to baseball-bat construction.

In the use of wooden ball-striking implements, such as golf clubs, and, more particularly, in base ball bats, many must be discarded because of failures which occur in the surface of the implement ending its useful life. One type of failure which frequently ends the usefulness of baseball bats is a separation which occurs in the growth layers of the wood of the bat. This has come to be commonly known as "chipping." "Chipping" is the peeling off or separation of a layer of the surface of the bat destroying the smooth curvature of that surface. Once a bat has been chipped it must be discarded. The loss of a bat is not only a financial loss but, in many instances, ball-players become accustomed to the weight and "feel" of the bat and therefore the loss of a favorite bat is an unpleasant experience.

In the past, various means have been suggested to improve the characteristics of baseball bats and constructions, such as completely laminated bats. Bats with hollow cores have been tried. Insofar as is known, these suggestions have not been successful and bats have remained substantially the same, without improvement for many years.

Briefly, this invention comprises the provision of at least one relatively dense reinforcing strip inlaid in the surface of a bat at a position away from the normal striking surface of the bat and the attendant details for this construction.

It is a purpose of this invention to provide an improved construction which greatly reduces the failure of ball-striking implements and baseball bats by reason of chipping. It is another purpose to produce this result without changing substantially or marring the accustomed appearance and fine wood beauty of baseball bats. It is yet another purpose to produce a baseball bat with greatly reduced chipping characteristics at minimum increase in manufacturing complexity.

To these and other ends, this invention comprises a ball-striking implement construction, the preferred form of which is disclosed in the following description and attached drawing. Although the implement structure described and shown in detail refers with particularity to the baseball bat, it is apparent that this invention should not be so limited thereto. Significant features of this invention could apply with equal qualification to any ball-striking implement.

In the drawings:
Fig. 1 is a side elevational view of a baseball bat having the inlaid reinforcement strips of this invention;
Fig. 2 is a cross sectional view taken along the line 2—2 of Fig. 1;
Fig. 3 is a perspective view of a typical strip for inlay in a bat of this invention;
Fig. 4 is a rotated elevational view taken from the position 4—4 of Fig. 1; and
Fig. 5 is a perspective view of the baseball bat of this invention, being held in the normal position and grip.

At the present time and throughout the history of the game of baseball, bats have been made of wood. Better quality bats are at the present time made of white ash or hickory, the very highest quality bats usually being made of white ash. White ash has been chosen as the most desirable bat material because it is an open-grain hardwood and therefore is relatively strong as compared to the softwoods, because it may be found with desirable straight grain, and because it is not as heavy as some of the more close-grain hardwoods such as birch or maple. However, in spite of the above-described general attributes of white ash as a baseball bat material, it remains that white ash bats, as well as other bats, have been subject to failure by chipping.

The understanding of this invention and how it reduces chipping will be facilitated by an understanding of wood structure and its action under load. Wood is a fibrous material made up of successive tiered layers of high- and low-density material. When the wood is growing in a tree, the softer, low-density fibrous layers are produced at the rate of one each year during the spring growing season. The harder, more dense layers are produced one each year during the summer growing season. The growth during the spring growing season is faster, although the period may be shorter, and therefore the "spring-growth" layers are softer. The harder summer-growth layers are stronger and provide the majority of the strength in a wood section.

Any beam of wood and a baseball bat when considered as a beam will be stronger under longitudinal bending loads if the loads are applied in the plane of the growth layers. Therefore, it is and has been the conventional practice to provide baseball bats with indicia, by means of which the user may hold the bat in such a position that the impact loads produced when striking the baseball are properly oriented in the plane of the growth layers of the wood. This indicium is the trademark. By means of the trademark, the bat is designated with a conventionally used striking surface and this striking surface is normal to the plane of the growth layers in the baseball bat.

Referring to Fig. 1, a baseball bat, designated generally as 11, comprises an elongated body of generally cylindrical shape which is tapered to a handle portion 12 at one end and a bulbous portion 13 at the opposite end. The handle 12 is provided with a knob 14 to assist in preventing the user's hands from slipping off the end when the bat is properly held as shown in Fig. 5. At the opposite end 15 the bat 11 is rounded to a smooth, substantially semi-spherical shape.

As shown in Fig. 2 the wood of the bat comprises spring-growth layers 16 separated by summer-growth layers 17. The edges of the summer-growth layers 17 are indicated as a heavy line, the edges of which appear in Fig. 1. In a similar fashion the spring-growth layer 16 appears as a layer of finite thickness, in Fig. 1. As previously explained, the bat 11 is provided with a trademark 18 which serves a dual purpose of identifying the origin of the bat and indicating to the user the surface of the bat which is intended for striking the ball with the least likelihood of breaking the bat at the handle, because the maximum bending strength of the bat is utilized when it is properly oriented. Each baseball bat user is informed, in his early acquaintance with the game, that the bat should be held with the trademark up. This instruction causes the face of the bat as seen in Fig. 1 to be swung toward the ball during hitting action. Therefore, the usual striking surface of the bat is substantially normal to the plane of the growth rings of the wood in the bat. This striking surface is far away, and closely approaching 90° away, from the trademark side of the bat. To the right-handed batter the
striking surface of the bat 11 is indicated by the arrow labeled "S" in Figs. 2, 4, and 5. As most clearly seen in Figs. 1, 2, and 4, the bat 11 of this invention is constructed with at least one reinforcing strip 20 (three strips are shown in the example) indented in the surface of the bat at a position rotated away from the usual striking surface of the bat.

These reinforcing strips 20 are longitudinally disposed in mating grooves cut into the body of the bat in the enlarged bulbous portion adjacent to the striking surface. The strips extend from a position substantially opposite the trademark to the end 15 of the bat and are smooth and contoured to match the surface of the bat. The strips 20 are retained by a suitable cement or glue which is deposited on all sides of their substantially rectangular, cross-sectional shape.

The general over-all shape of a strip 20 may be that shown in Fig. 3 although the primary criterion is, of course, that it mate with the groove provided in the bat 11.

Strips 20 may be made of any suitable hard material, but it has been found that close-grain hardwoods, such as maple, are particularly satisfactory.

Chipping in baseball bats usually occurs at the surface opposite the trademark circumferentially removed and away from the striking surface of the bat. In this area, a separation occurs in one of the spring-growth layers and those layers on the outside of the separation peel away from the bat structure leaving a bat which is no longer circular in cross section. The longer side 21 of the rectangular, cross-sectional shape of strips 20 bridges from one summer-growth ring to the next and, therefore, ties the surface together and the spring-growth layers in place in the area where chipping usually occurs.

The number of reinforcing strips 20 has not been found to be critical in this invention and more or less may be used depending on circumstances such as the diameter of the bat cross section, the material available and the expense thereof, the strength of the wood, etc. However, it has been found that the addition of at least one strip will reduce the number of failures by chipping.

In an example baseball bat, three hardwood inserted of maple having a width of ¾ inch, a depth of ¾ inch on the center strip and a spacing of 4 inch from center to center was constructed. This structure was tested on a machine which strikes a blow from a swinging hammer having a face of leather-covered hardwood. Blows were struck over an area of the striking surface of the bat. A similar test on a control specimen of like cross-sectional shape having a plurality of relatively dense close-grain hardwood strips of substantially rectangular cross-section, fastened in mating longitudinal recesses in the surface of the bulbous end of said bat with the longer sides of their rectangular cross section substantially perpendicular to the growth layers of the wood, said recess being of a depth substantially less than the diameter of said bat.

2. A baseball bat comprising: a one-piece elongated cylindrical wooden body tapered to a handle portion of reduced diameter from a portion of enlarged diameter and bulbous shape, at least one reinforcing strip of relatively dense, close-grain hardwood of substantially rectangular cross section, fastened in a mating longitudinal recess in said bat with the longer sides of its rectangular cross section substantially perpendicular to the growth layers of the wood, said recess being of a depth substantially less than the diameter of said bat.

A wooden baseball bat comprising: a one-piece elongated cylindrical wooden body, tapered to a handle portion of reduced diameter from a portion of larger diameter having at least one reinforcing strip of a material denser than said wooden body, inlaid longitudinally into the surface of said portion of larger diameter at a position circumferentially removed from the striking surface of the bat, and substantially perpendicular to the plane of the growth layers of the wood, said strip being bonded to the grain of the wood of said bat to prevent chipping of said surface.

4. A construction to prevent chipping of a baseball bat of an elongated cylindrical wooden body tapered to a handle portion of reduced diameter from a portion of larger diameter and bulbous shape comprising: at least one strip of close-grain relatively dense hardwood material cemented in a mating recess longitudinally disposed in the surface of said portion of larger diameter of said bat circumferentially removed from the striking surface of said bat and substantially perpendicular to the plane of the growth layers of the wood, said recess being of a depth less than the diameter of said larger portion of said bat.

5. A baseball bat comprising: an elongated cylindrical open-grained hardwood body tapered to a handle portion of reduced diameter from a portion of increased diameter and bulbous shape having a trademark imprinted thereon at a position substantially perpendicular to the plane of the growth layers in the wood on the bulbous-shaped portion, having three strips of relatively dense, close-grained hardwood reinforcement inserts cemented in mating longitudinally disposed grooves in the side of said bat opposite the trademark, said three strips having a substantially rectangular cross-section and disposed in the bat with the longer side of said rectangular cross section substantially perpendicular to the growth layers of the bat and normal to the trademark.

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