United States Patent [19]

Fujii

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[45] **Jan. 21, 1975**

[54] **BASEBALL BAT**

[76] Inventor: **Hirokazu Fujii,** No. 59, 2-chome, Obiraki-cho, Fukushima-ku, Osaka, Japan

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[52] **U.S. Cl.** ..... **273/72 A**

[51] **Int. Cl.** **A63b 59/06**

[58] **Field of Search** ..... 273/67 R, 67 D, 67 DA, 273/68, 72 R, 72 A, 80 R, 80 B, 82 R, 82 A, 82 B, DIG. 1-12

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Primary Examiner—Richard J. Apley
Attorney, Agent, or Firm—Stewart and Kolasch, Ltd.

[57] **ABSTRACT**

A metallic ball bat comprising a bat body made of a metallic tube material wherein a metallic sound arresting ring made of a rubber or plastic material is disposed inside the bat and advantageously in contact with a light-weight, hard, plastic cap which is inseparably inserted on the head of bat body.

Said bat body may also include a metallic repellent member disposed therein. In such as case a sound arresting member is provided on both sides of said repellant member. This arrangement increases the repellency of the bat portion for hitting a ball, and arrests the metallic sound and resound which otherwise would be created at the time of impact between the bat and ball.

9 Claims, 8 Drawing Figures

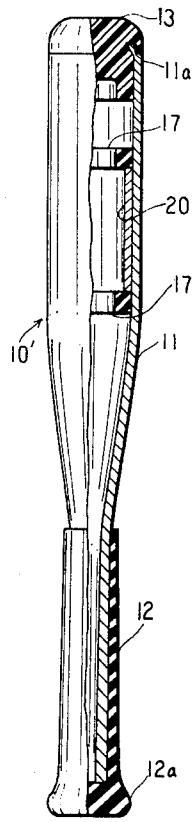


FIG. 1
PRIOR ART

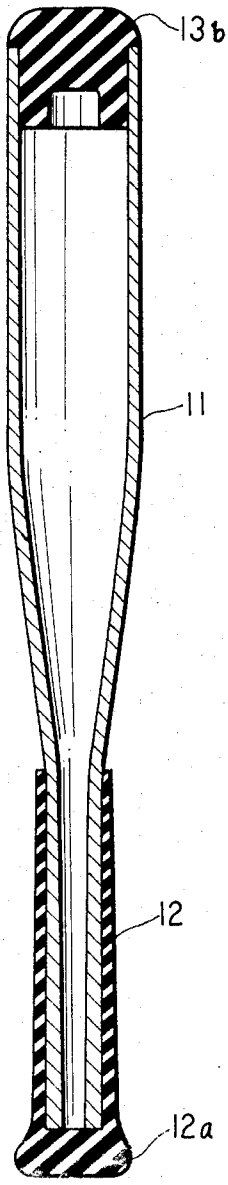


FIG. 2

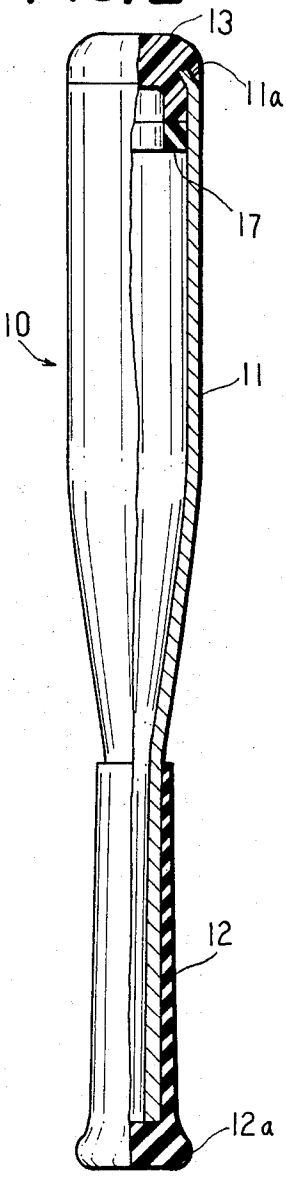


FIG. 3

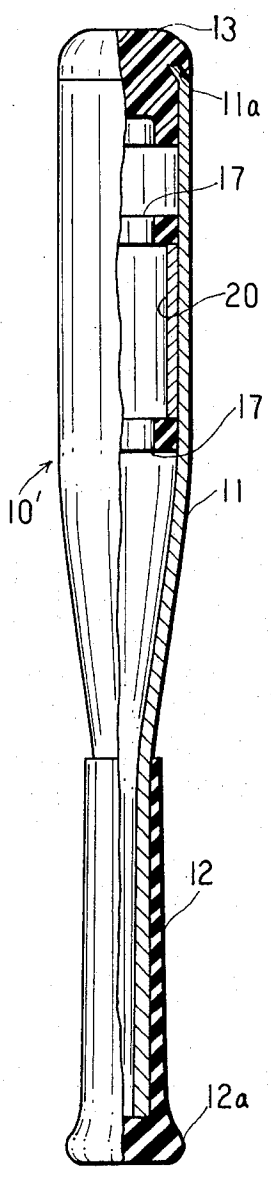


FIG. 6

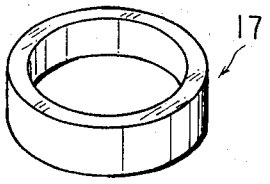


FIG. 7

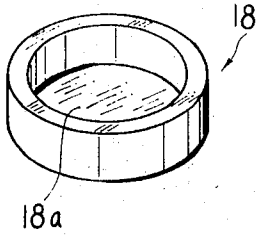


FIG. 8

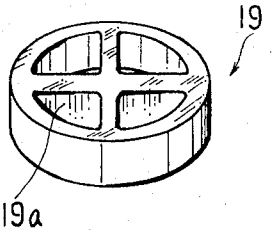


FIG. 4

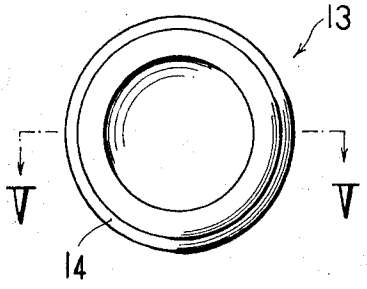
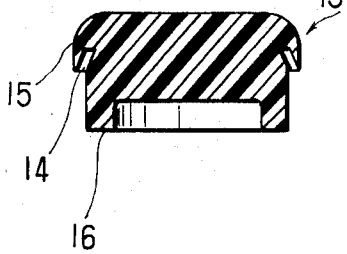


FIG. 5



BASEBALL BAT

The present invention relates generally to an implement for hitting a ball in a baseball game, and more particularly to a baseball bat composed of a metallic cylindrical body having its head protected with a cap of a light-weighted hard synthetic resin, and its inner hollow portion below the cap filled with a resilient element for absorbing the reverberations and vibrations that take place in the hitting portion of the bat when the bat strikes a ball.

In recent years, an increasing number of metallic baseball bats have reached the market place and are being used in place of the conventional wooden bats. In order to produce such metallic baseball bats it is necessary to form a bat body in such a manner that the body can deaden the shrill metallic sound which is caused by the bat striking a ball. Such a metallic sound is unpleasant on the nerves of a batter who has long been quite familiar with that batting sound of conventional wooden bats which gives him an acoustic sense of stability.

Thus one of the greatest concerns of metallic baseball bat manufacturers has been focussed on the problems of deadening or mitigating the metallic sound and resound that always accompanies a metallic bat and providing said metallic bats with batting sound having an acoustic sense of stability.

As a consequence thereof, attempts have been made to solve this problem by providing a metallic baseball bat having its head portion protected with a cap **13***b* made of vulcanized rubber as is shown in FIG. 1 of the accompanying drawing. However, this cap-headed bat has the following three fatal defects: Firstly, due to repeated batting impacts produced in the hitting portion of the baseball bat at a baseball game and during practice, said cap **13***b* is eventually forced from the head of the bat by said repeated impacts. This is true even if the cap is adhesively secured on the head of the bat by means of a strong adhesive agent because the adhesive agent is not sufficient strong to resist such repeated impacts. Thus the cap **13***b* is resiliently deformed at each moment of impact and gradually separates from the inner peripheral wall of the metallic cylinder forming the head of the bat. Secondly, in the event that a batter fails to strike a ball, in a fit of chagrin he is likely to violently beat the head of the bat against the ground, the result being that the beatened head portion of the bat is irreversibly deformed since the rubber forming said cap is directly subjected to the impacts and deformed too extensively by each impact to maintain the configuration of the head portion of the bat. Finally, when protected with the above-mentioned rubber cap, the head of the metallic bat is unavoidably made too heavy so that the bat body is deprived of its balance, making it difficult for a batter to effectively swing the bat and hitting the ball in his easiest posture. This is because, in addition to being made very heavy in weight, said rubber cap must be large in size in order that it is not readily separated from the head of the bat at the moment of impact.

Accordingly, it is one of the main objects of the present invention to provide an improved type of metallic baseball bat quite free from the above-mentioned defects found in existing metallic bats.

It is another object of the present invention to provide an improved type of metallic baseball bat having a head portion protected with a cap made of a light-weighted, hard synthetic resin thereby preventing the deformation of the head portion which otherwise would take place at the moment of an impact given thereto.

It is a further object of the present invention to provide a novel type of metallic baseball bat having a metallic cylinder interiorly provided with a metallic sound arresting member thereby including the bat to make a hitting sound most similar to that of the conventional wooden bat.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, wherein,

FIG. 1 is a vertical section showing a prior art metallic baseball bat having a head portion protected with a rubber cap;

FIG. 2 is an elevation showing a first embodiment of the present invention, with parts broken away,

FIG. 3 is likewise an elevation showing a second embodiment of the present invention, with parts broken away,

FIG. 4 is an enlarged bottom plan view showing a cap made of a light-weighted, hard synthetic resin to be inserted on the top end of a metallic cylinder forming a metallic baseball bat in accordance with the present invention;

FIG. 5 is a vertical section taken on the line V — V of FIG. 4;

FIG. 6 is an enlarged perspective view of a metallic sound and resound arresting ring member to be used in the embodiments of FIGS. 2 and 3; and

FIGS. 7 and 8 are enlarged perspective views respectively illustrating a modified ring member of FIG. 6.

Referring now to the accompanying drawing, and especially to FIG. 2, the baseball bat **10** of the present invention comprises a metallic cylinder **11** formed into the standard shape of a conventional bats by mechanically drawing a metallic pipe. The lower portion of said metallic cylinder **11** is coated with either rubber or a synthetic resin to form a grip portion **12** on the bat.

Preferably a rough surface (not shown in the drawing) is formed over said grip portion **12** said rough surface serving as a non-skid grip which helps a batter swing the bat in an accurate manner.

It is also preferable that the lowermost portion of the grip portion **12** circumferentially extends beyond the grip **12** to form an annular edge **12***a* thereby preventing the batter's hands from readily slipping off of the grip portion the by the force of the impact caused at the moment when the bat strikes the ball.

The uppermost end of the metallic cylinder **11**, substantially forming an inner head portion of the bat body **10**, is bent inward along the circumference thereof to form an inwardly curved annular edge **11***a*.

As shown in FIGS. 4 and 5, there is prepared a cap **13** made of a light-weighted, hard synthetic resin and provided with an annular groove **14** having substantially the same shape as said edge **11***a* so as to fittingly receive the latter edge.

In order to mount said cap **13** onto the head portion of the bat body **10**, said edge **11***a* formed in the uppermost end of the metallic cylinder **11** is first so disposed as to face in exactly opposed relationship to said annular groove **14** of the cap **13** and then forcibly pressed

in the axial direction thereof to firmly inserted said cap into said annular groove **14.**

Accordingly as a result of this pressing operation, said edge **11***a* is forced into the groove **14** of the cap **13** groove **14** which bends said edge slightly downward, thus resulting in said cap **13** and the metallic cylinder **11** being firmly engaged with one another and preventing the cap **13** from being separated from the bat body **10** even by the force of the bat striking a ball.

Incidentally, in order that the externally exposed peripheral wall **15** of the cap **13,** as shown in FIG. **5,** can be aligned with the outer peripheral wall of the metallic cylinder **11,** it is necessary that the outer diameter of the wall **15** is exactly the same as that of the metallic cylinder portion **11** adjacent thereto.

In this case, it is also preferable that the lowermost brim portion **16** of the cap **13** which is exposed to the inside hollow portion of the metallic cylinder **11,** (see FIG. **5**) is formed so as to have the substantially same outer diameter as the inner diameter of the metallic cylinder portion **11** whereby the cap **13** can be tightly sealed to the inner periphery of the metallic cylinder **11.**

Prior to mounting the cap **13** onto the uppermost end of the metallic cylinder **11,** a metallic sound arresting ring member **17** (see FIG. **6**) is rigidly fixed to the inner periphery of the metallic cylinder **11,** said ring member **17** being made, for example, of rubber or any suitable plastic material such as that employed in a pick-up device for stereophonic record players for deadening any small exterior vibrations which otherwise would be directly transmitted to a needle on a rotating disc resulting in a grating noise.

It has been experimentally proved that when sealingly fixed to the inner peripheral wall of the metallic cylinder **11** and positioned just below and contiguous with the cap **13,** said ring member **17** functions to arrest the high-piched metallic sound that otherwise would accompany each contact of the bat with the ball.

However, advantageous results can also be obtained if said ring member **17** is located in the metallic cylinder **11** a little deeper axially than the preceding embodiment so as to be disposed in the center portion of the bat. This portion can be located by determining the point where the smallest amplitude of vibratory waves appears on the screen of a synchronoscope or an oscilloscope when the bat is provided with an impact. In this case, therefore, the ring member **17** may be positioned somewhat distant from the cap **13.**

Advantageously, said metallic sound arresting member **17** which can be made of a light, hard plastic material is formed into a ring or an axially short cylinder having considerable wall thickness since it has been empirically confirmed that such thickness is effective in arresting any metallic sound while at the same time is sufficiently light-weighted so as to not adversely affect the overall weight or balance of the bat.

Furthermore, in place of the ring member **17** shown in FIG. **6,** a similar metallic sound arresting effect can also be obtained by applying to said batting portion a modified ring member **18** shown as having a base **18***a* in FIG. **7** or still a further modified ring member **19** having partitioned cross walls **19***a* as shown in FIG. **9.** It will be readily understood that these modified ring members may also be further changed into any number of other designs.

In FIG. **3** is illustrated a second embodiment carried out in accordance with the present invention in which a metallic cylindrical repelling insertion member **20** is provided in the inner periphery of the metallic cylinder portion **11** corresponding to the batting portion of bat **10** where a batter usually strikes a ball. This takes advantage of the most resilient portion of the bat **10.**

For said metallic cylindrical repelling insertion member **20** there is employable for example one of the varied type insertion members **16***a* to **16***f* disclosed in my U.S. Pat. application Ser. No. 237,390 filed on Mar. 23, 1972, although said member **20** is not itself the purpose of the present invention. However, in the event that said member **20** is mounted in the inside of the metallic cylinder **11,** it is necessary to provide a pair of metallic sound arresting members **17, 17** at the upper and lower ends of said member **20** and in contacted relationship therewith.

In the situation where said pair of metallic sound arresting members **17, 17** are provided at both ends of the member **20** in the above-mentioned manner, it is not always necessary to mount another similar metallic sound arresting member in contact with the lowest end of cap **13** in addition to said pair.

It will be understood that the present invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be invisioned without departing from the spirit and scope of the invention.

I claim:

1. A substantially hollow metallic ball bat comprising a generally cylindrical barrel portion and a generally cylindrical handle portion, said barrel portion being larger in diameter than said handle portion said barrel portion terminating in an open end, a cap element inseparably mounted on and extending into said open end two, spaced apart metallic-sound arresting ring members centrally disposed in the barrel portion of the ball bat and a metallic cylindrical repelling member disposed between said sound arresting ring members, said repelling member being contiguous with said ring members and the inner periphery of the barrel portion of the bat.

2. The ball bat of claim **1,** wherein the metallic-sound arresting ring member is rigidly fixed to the inner periphery of the barrel portion.

3. The ball bat of claim **2,** wherein one of said ring members is contiguous with the cap element.

4. The ball bat of claim **1,** wherein the metallic-sound arresting ring member is made of a plastic material.

5. The ball bat of claim **1,** wherein the metallic-sound arresting ring member is made of rubber.

6. The ball bat of claim **1,** wherein the metallic-sound arresting ring member is an axially short cylinder having a substantial wall thickness.

7. The ball bat of claim **6,** wherein the axially short cylinder is further provided with cross walls which interconnect the cylinder walls like the spokes of a wheel.

8. The ball bat of claim **6,** wherein the axially short cylinder is further provided with a base which extends across the barrel portion.

9. The ball bat of claim **1,** wherein the upper edge of said open end has radially inwardly extending walls and said cap element is provided with an annular inwardly extending groove, said groove receiving said walls to form a wedgewise interlocking relationship between the bat and the cap element, the outer diameter of said cap element being substantially the same as the outer diameter of said barrel portion of the bat.

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