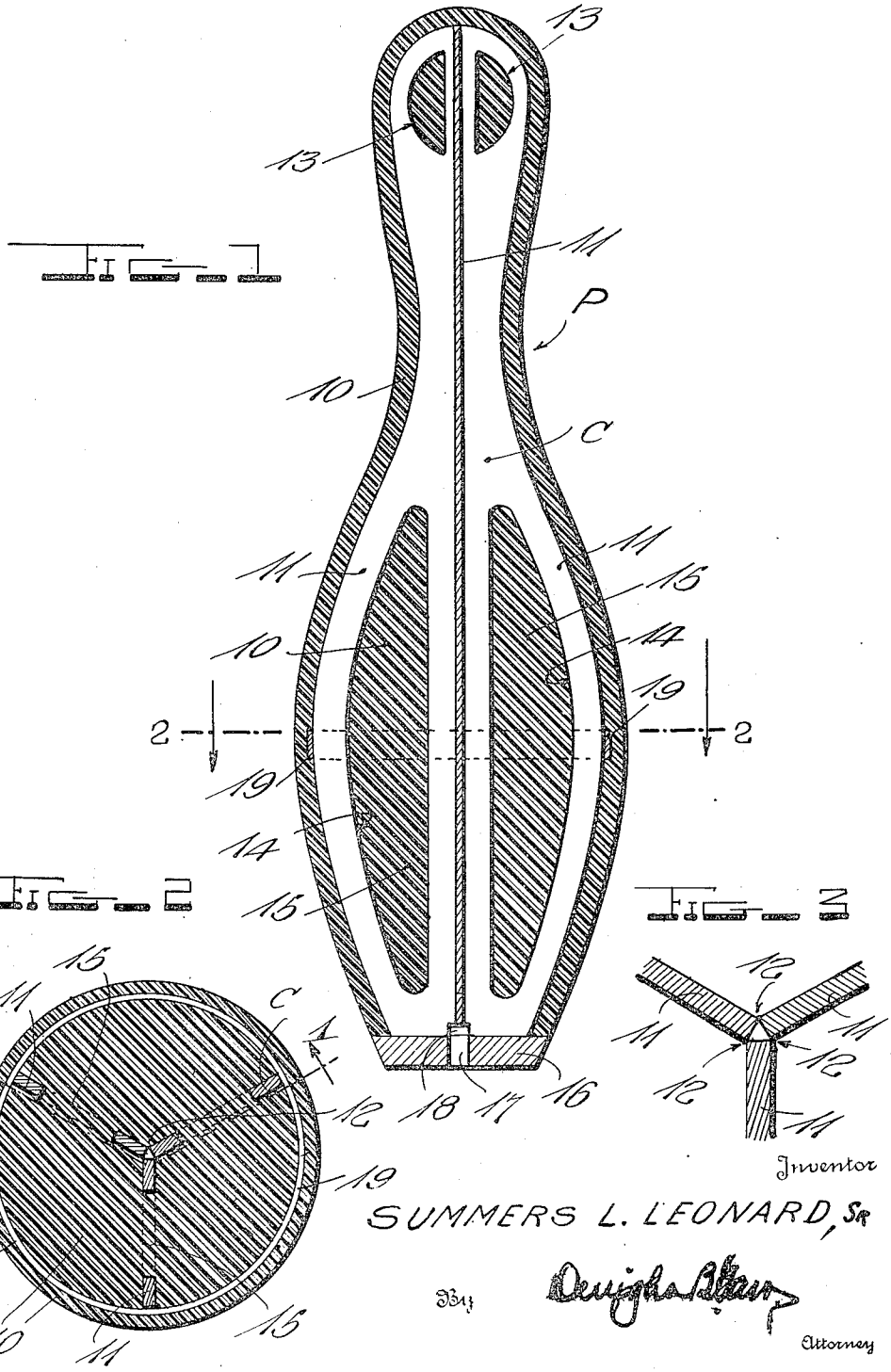
May 1, 1951 S. L. LEONARD, SR 2,551,272

METAL-REINFORCED PLASTIC BOWLING PIN

Filed Nov. 20, 1945 2 Sheets-Sheet 1



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METAL-REINFORCED PLASTIC BOWLING PIN

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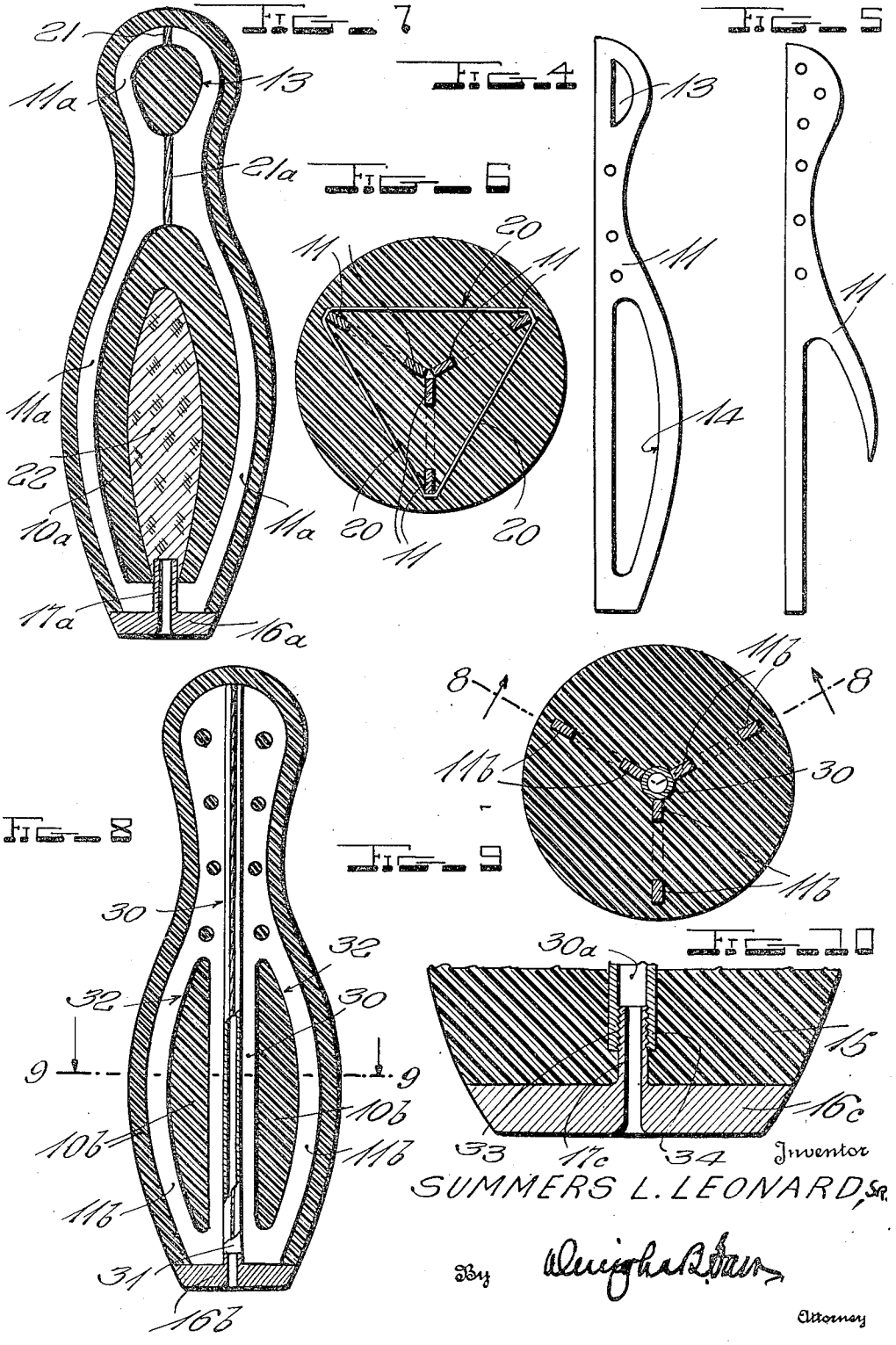

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METAL-REINFORCED PLASTIC BOWLING PIN

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2 Claims. (Cl. 273—82)

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This invention is a game piece or "pin" of the type designed for use in playing ten pins, duck pins, candle pins, and other similar games.

One of the objects of the invention is to provide a "pin" of the type mentioned having a body of molded plastic material in lieu of wood which is now commonly employed for the manufacture of such devices.

A further object is to provide a molded pin in which the body material is strongly reenforced without increasing the pin-weight beyond the maximum limit provided by the accepted rules of the game, so that the "pin" will not only resist the shocks of the ball-impact, but at the same time warping or other distortion of shape of the "pin" will be prevented.

A further object is to provide a "pin" designed for the purposes mentioned which may be easily and accurately molded in a manner to conform strictly with the weight and dimensions imposed by the standard rules of bowling.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:

Figure 1 is a longitudinal sectional view illustrating one form of bowling pin constructed in accordance with the invention, taken on line 1—1 of Fig. 2.

Figure 2 is a transverse sectional view on the line 2—2, Figure 1.

Figure 3 is an enlarged detail sectional view illustrating the manner of connecting the wings of the reenforcing core.

Figure 4 is a side elevation of one of the core wings detached.

Figure 5 is a view similar to Figure 4 illustrating a slight modification of the latter.

Figure 6 is a cross-sectional view similar to Figure 2 illustrating a modification of means for bracing the wings.

Figure 7 is a longitudinal sectional view of a bowling pin illustrating a second modification of the reenforcing core.

Figure 8 is a longitudinal sectional view illustrating another modified form.

Figure 9 is a cross-sectional view on the line 9—9, Figure 8.

Figure 10 is a vertical sectional view illustrating a modification of Figure 8.

Referring more particularly to Figures 1, 2 and 3, P designates a bowling pin molded of a suitable plastic material 10, having embedded therein a core C. Any desired plastic material or synthetic resin which is capable of withstanding the shocks incident to being struck by a heavy ball, may be employed. A satisfactory example is cellulose butyracetate because of its inherent elasticity.

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The core C is constructed of a plurality of equally spaced radially disposed wing-like members 11, each of which is constructed of rigid flat metal, and connected in suitable manner at their adjacent inner edges at positions 12 which coincide with the longitudinal axis of the pin. The members 11 may be constructed of any desired metal having the requisite rigidity, but it is preferred to construct them of aluminum or aluminum alloy, so as to keep the weight thereof at a minimum. The inner edges of said members may be joined by welding.

It will be noted that the outer edge of each member 11 conforms to the general exterior contour of the completed pin, the inner edge being straight, so as to lie parallel with the longitudinal axis of the pin body. Each member 11 is provided with one or more openings therein, as indicated at 13 and 14, respectively. The number of said openings may vary, as may be desired, but in the smaller dimensioned pins the opening 13 will ordinarily not be used. If more than one of such openings is employed they are arranged in longitudinally spaced relationship. The opening 14 is of substantial length and width as compared to the dimensions of the pin body P. It will also be observed that the plastic material 10 completely encloses and embeds the core members, to any desired depth, and is provided with an axial portion 15 which extends through the openings 13 and 14, so as to surround and interlock with the axially disposed joined inner edges of the members 11.

It is preferred to provide a base plate 16 for the pin body, having a central opening 17 to receive the peg of a "pin-setting" device. Said plate is preferably welded or otherwise secured to the lower edges of the members 11. Obviously this plate may be omitted if desired, and the opening 18 in the plastic material made somewhat deeper. It may also be desirable, in the case of the larger types of pins, to reenforce the core member C. This may be done by welding or otherwise attaching an annular bracing member 19 to the outer edges of the members 11, as shown in Figures 1 and 2; or by connecting said edges by means of horizontally disposed braces 20, extending diagonally from one member 11 to another, as shown in Figure 6. Obviously the bracing elements 19 and 20, may be used conjunctively, or either or both may be omitted without departing from the spirit of the invention.

The form of wing-like core member illustrated in Figure 5 is primarily designed for the smaller pins. It is substantially the same as the form illustrated in Figure 1, except that the lower portion of the member 11 of the last mentioned figure is omitted.

In the form of the invention illustrated in Figure 7 the core members 11[a] are connected at the top, as indicated at 21 and at an intermediate portion 21[a]. At their lower ends they are connected by a base plate 16[a] which is provided with a tubular boss 17[a], to receive the peg of a pin-setting device. Embedded axially within the plastic material 10[a] is a core of cork or similar resilient material indicated at 22.

In the form of the invention illustrated in Figures 8, 9 and 10, the wing-like members 11[b] are practically the same as those illustrated in Figures 1 and 2. However, in the modified form the inner edges of these members are welded or otherwise secured to a tubular member 30, which is disposed axially with respect to the pin body. The lower end 31 of said tube extends to the bottom plate 16[b], which is welded or otherwise secured to the member 30, as well as to the lower edges of the members 11[b]. The members 11[b] are embedded within a body of plastic material 10[b], which interlocks with openings 32 in said members 11[b]. If desired, the base plate 16[c] may be provided with a tubular boss 17[c], which is externally threaded at its free end, as indicated at 33, Figure 10. Said threaded boss may be removably engageable with a complemental threaded portion 34 of the tube 30[a].

The advantages of the invention will be readily understood by those skilled in the art to which it belongs. For instance, it will be observed that a very simple and inexpensive form of bowling pin is provided, that will conform to the standard weight and dimensions required by the accepted rules of the game. It will also be noted that a molded pin is provided which is strongly braced against distortion or warping by any cause, and which is so reenforced against shocks due to impact of the ball, as to provide a very durable construction.

It is to be understood that although the invention has been illustrated herein as embodying the contour of the commonly employed "ten-pin," it is not limited in this particular, because the contours of the reenforcing core may be varied to conform to the outside contours of any other type of "pin," without departing from the spirit of the invention. Therefore, wherever the term "bowling pin" is employed in the specification and the claims, it is to be understood that any "pin" which is used in games which require the knocking down of pins by a moving ball, is considered to be the equivalent thereof.

Having thus explained the nature of the invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what is claimed is:

1. A bowling pin of the character described, comprising a molded body of plastic material small at its upper end and relatively wide at its mid portion, a core member embedded within said body, said core member comprising a plurality of radially disposed wing-like members of rigid flat metal having straight inner longitudinal edges in substantially abutting relationship in the longitudinal axis of said body, the outer edges of said members shaped to conform to the external contour of said body but located inwardly from the outer surface thereof, substantial portions of said wing-like members cut away to provide elongated openings in the area of the wider parts of said pin body and inwardly from the inner and outer longitudinal edges of said members, an annular band rigidly connected to the outer edges of said wing-like members at substantially the mid portion of said body, the plastic material of said body filling said elongated openings and covering the outer edges of said wing-like members as well as said annular band to securely anchor said members therein.

2. A bowling pin of the character described, comprising a molded body of plastic material, a core member embedded within said body, said core member comprising a plurality of radially disposed wing-like members of rigid flat metal having straight inner longitudinal edges in substantially abutting relationship in the longitudinal axis of said body, the outer edges of said members shaped to conform to the external contour of said body but located inwardly from the outer surface thereof, bracing means disposed laterally of said core member and connecting the outer edges of said wing-like members, substantial portions of said wing-like members cut away to provide elongated openings in the area of the wider parts of said pin body and inwardly from the inner and outer longitudinal edges of said members, the plastic material of said body filling said elongated openings and covering said bracing means and said outer edges of the wing-like members to securely anchor said members and bracing means within said body.

SUMMERS L. LEONARD, SR.

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