April 13, 1965 J. M. ERNST 3,178,182

BOWLING PIN BASE

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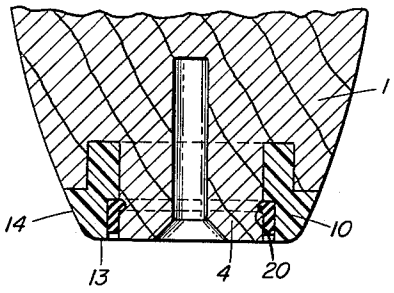


Fig. 1

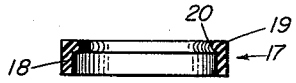


Fig. 3

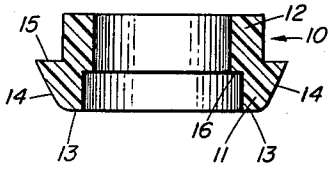


Fig. 4

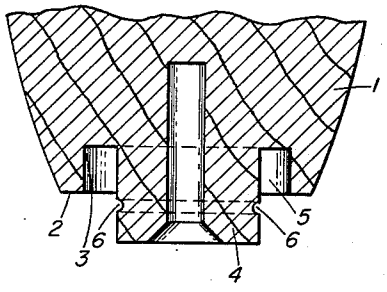


Fig. 2

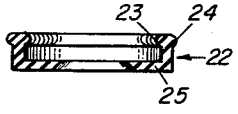


Fig. 6

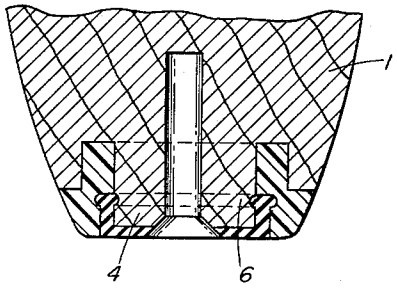


Fig. 5

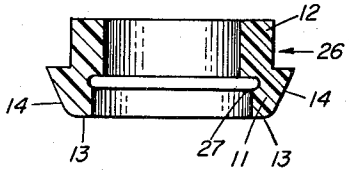


Fig. 7

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BOWLING PIN BASE

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This invention relates to bowling pins and more particularly, to a novel, replaceable base for bowling pins. A bowling pin is subjected to severe use from the battering of balls and other pins. One of the most pronounced areas of damage due to the striking of one pin against another and against the bowling alley, and from being hit by the ball, is the butt end, especially the corner portion of the pin base, i.e. the annular segment which forms a juncture between the side and bottom faces. As a consequence, most commercial pins are now equipped with an attachable wear resisting base of tough plastic or other durable composition. Many of the arrangements employed comprise a base piece which encircles a projecting shank portion of the pin and is secured by means such as screws, adhesives and/or some locking arrangement to hold the attachable base on the pin.

The shortcomings of base fittings of the prior art base often reside in the cumbersome procedure needed to affix the base or in the difficulty of producing a practical securing arrangement which effectively resists separation of the base piece from the butt of the pin. Each of the known prior art means for securing bases of this type has not been entirely satisfactory. Screws for example require considerable time to affix to the base. Adhesives for securing base pieces, if compatible initially with both the pin butt composition and the base insert, have not proven satisfactory in use largely due to dimensional changes occasioned by evaporation of residual moisture from the wood or compression at or near the bond, for example, which weakens and severs the bond. Adhesives moreover require relatively long periods to apply; are undesirable to use; require drying periods which are dilatory and the adhesive compositions are oftentimes damaging to the plastic finish of the bowling pin. The pin base provided by the present invention seeks to obviate these and other objections of the prior art and to provide an inexpensive improved readily affixed two-piece fitted base for bowling pins.

The present invention utilizes a main base piece of relatively thick rigid material easily inserted into the pin butt and an inner locking ring or cap of flexible composition to hold the base piece securely in place.

It is an object of the present invention to provide an inexpensive press fitted bowling pin base of excellent durability. It is a further object to provide a replaceable bowling pin base of relative simplicity of construction easily affixable to a pin base, and of excellent security against removal during use of the pin in play.

Additional features and advantages of the invention will become apaprent from the detailed description provided hereinafter.

In the accompanying drawings:

FIG. 1 is a cross sectional view and shows the butt portion of a bowling pin containing the arrangement of the two-piece base of the invention secured in position therein.

FIG. 2 is a cross sectional view illustrating the configuration of the undercut in the butt portion of the bowling pin.

FIG. 3 is a cross sectional view of the inner locking ring member of FIG. 1.

FIG. 4 is a cross sectional view of the main base member of FIG. 1.

FIG. 5 is a cross sectional view of the butt portion of

a bowling pin showing a modified attachable base structure.

FIG. 6 is a cross sectional view of the modified inner locking ring or cap illustrated in FIG. 5.

FIG. 7 is a view partially in cross section of the main base member for cooperating with the inner locking ring member of FIG. 6.

Referring in greater detail to the figures, a wooden bowling pin body 1 of usual shape is shown with the butt comprising an undercut portion 2 forming a projecting core 4. However, the base of the invention may likewise be applied to a pin formed of plastic or metal foam or other suitable composition having property such as rebound, sound etc. substantially similar to wood. Abutting the core 4, a downwardly facing groove 5 is formed between a cylindrical wall 3 and the core 4. Near the bottom of the core 4 an outwardly facing locking groove 6 is provided in the core. As seen in FIG. 1, the base insert 10 is positioned in the undercut and the skirt or disk portion thereof forms an extension 13 and 14 of the bowling pin bottom and tapered side respectively at the juncture of the bottom surface and side surface of the pin. The base piece 10 is preferably formed of a durable relatively rigid impact and chip resistant material. Any of the commercially available resinous compositions having these durable properties such as nylon, cellulose acetate butyrate, acetal resin marketed under the brand name Delrin, ethyl cellulose, polyethylene, polypropylene, polycarbonate and the like, may be used. The locking ring or cap is formed of a relatively flexible material such as natural or synthetic rubber or other synthetic resinous composition having rubbery or substantially elastic property capable of being stretched at least to the extent enabling the locking ring to be inserted into position. If desired the ring or cap may be reinforced internally with wire, nylon or rayon cord etc.

In affixing the base to the pin, the main base piece 10 is positioned about the core 4 in the undercut configuration of the bowling pin and the locking ring 17 is press-fitted over it into locking relationship in the core.

The undercut of the pin comprises an annular shoulder portion 2, a downwardly facing groove 5, the projecting core 4 and the circumferential locking groove 6 formed in the core 4. In attaching the base of the invention to the pin body, the main base member 10 is first inserted into the undercut of the pin substantially filling the groove 5 and forming extensions of the side 14 and bottom 13 of the pin faces. The ring member 17 shown in cross section in FIG. 3 comprises a tough but elastic substantially inverted L-shape configuration comprising a vertical portion 18 and a horizontal portion 19. The horizontal dimension 19 comprises the locking bead 20 fitted into the locking groove 6 in the pin core 4. The main base member 10 comprises a frusto-conical skirt portion 11 containing a recess at the bottom for receiving the locking ring and an upstanding integral collar portion 12. The ring member 17 secured over the core bottom locks the two base members securely in the undercut of the pin.

Referring again the FIG. 1, the base member 10 is first press-fitted into the undercut groove 5 and secured against release by the bead 20 of the ring 17 upon engagement in the groove 6 of the core. Retention of the base arrangement is aided by the shoulder 16 abutting against the upper face of the ring member 17. When appropriately secured, it is seen, the elements 10 and 17 are press-fitted and locked into place; the shoulder 15 abuts the undercut portion 2 of the pin butt; the flexible bead 20 is engaged in the locking groove 6; the shoulder formed by the upper face of 19 of the locking ring 17 abuts the shoulder 16; and the face 13 of the main base member 10 forms an extension 13 and 14 of the bottom and tapered side respectively of the pin. If desired, the bottom face of the annu-

lar ring member 17 may be co-planar with the bottom of the pin and face 13 of the base piece 10 or the bottom of the locking ring may be recessed slightly, if so desired as shown in FIG. 1.

Each of the two members of the base insert is preferably prefabricated to produce a snug fit. Generally the members are sized so that the inside diameter of the collar portion 12 of the member 10 is several mils (i.e. about 2–5 mils) smaller than the outside diameter of the core 4 and the outside diameter of the collar portion 12 of the member 10 several mils larger than the diameter of the wall 3 of the groove 5. The size of the member 17 is dependent substantially upon the composition from which this member is formed. Preferably the diameter of the locking ring is as small as practical such that when expanded, the bead 20 will snugly fit over the lower portion of the core 4 and upon alignment the bead 20 will securely lock in the groove 5.

The ring member in FIGS. 1 and 3 has been illustrated as a substantially inverted L-shape cross section but it is apparent that this shape may take an alternate suitable configuration e.g. circular, oval, or substantially T-shaped as illustrated in the modification of FIGS. 5–7. In this embodiment, the undercut of the pin butt is substantially that illustrated in FIG. 2. The securing cap 22 in FIG. 6 is provided with a dual locking bead comprising inner bead 23 which functions in the manner described in connection with the bead 20 of FIG. 3 and the outer bead 24 which serves as an additional safeguard against release. The bead 24 when pressed in position is engaged in the groove 27 formed in the base 26 illustrated in FIG. 7. Like parts of FIG. 7 functioning in the manner of similar parts in FIG. 4 have been designated with like numerals. It will be apparent that the member 22 may be so constructed that the outer bead 24 may be located at a lower position near the bottom of the ring rather than as shown horizontally aligned with the bead 23. In FIG. 3 the locking member has been provided with a central aperture in order to provide access to those pin spotting mechanisms utilizing a locating pin elevated in the floor of the bowling alley. It will be apparent, however, that this arrangement may be modified in structure so that the bottom face of the member 17 is solid or partially enclosed as illustrated at 25 by the bottom face of the member 22.

While the present invention is illustrated and described in connection with a specific arrangement, it should be understood that the invention is not limited precisely to the structure illustrated and described but includes modifications that are obvious to one skilled in the art in the light of the inventive improvement herein provided.

I claim:

1. In combination a bowling pin having its butt end provided with an undercut at the juncture of the bottom surface and the side surface of the pin forming thereby an outwardly projecting central core, said undercut extending into the body of the pin adjacent said core and forming a downwardly facing annular groove leading to a circumferential outward facing locking groove near the base of said core and spaced from the floor of said annular groove, an annular base member comprising an annular frusto-conical skirt portion forming the junction for the bottom and side of the pin and, integral with said skirt portion, an upright collar portion encircling and engaging said core and terminating at its lower end in a shoulder, said base member containing an annular central recess in the bottom thereof terminating at said shoulder, and an inner cylindrical locking ring for said base member in abutment with, and terminating at, the shoulder of said base member, said locking ring comprising an annular bead engaged in said locking groove in the core.

2. The combination of claim 1 wherein said inner ring has an auxiliary annular securing bead and said base member has a corresponding annular securing groove for said auxiliary bead to lock said base member to the core of said pin.

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