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BOWLING PIN

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FIG. 1.

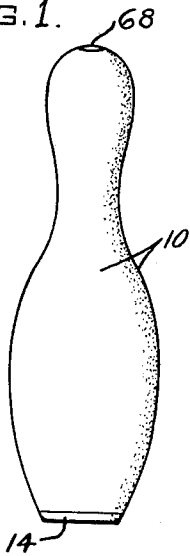


FIG. 2.

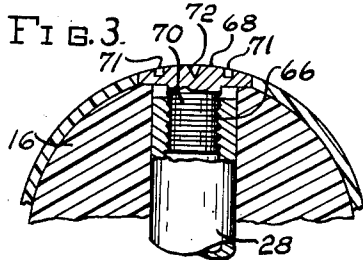
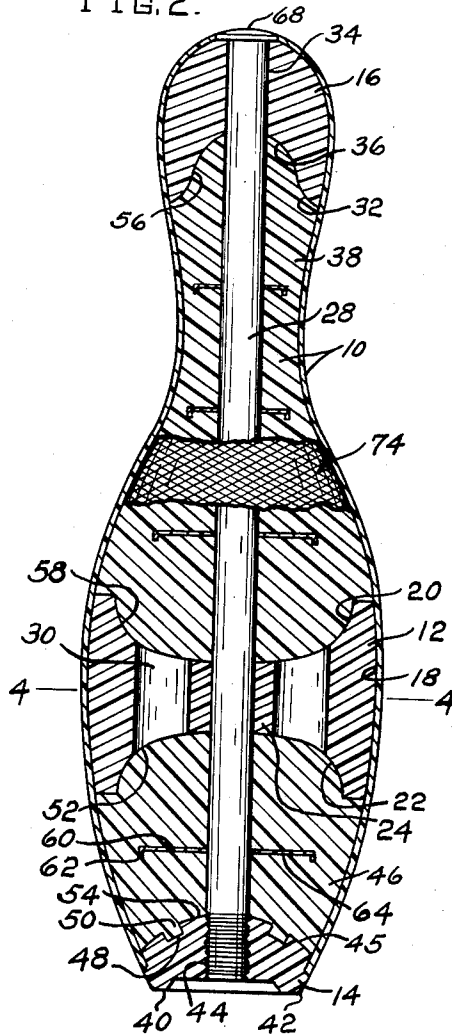
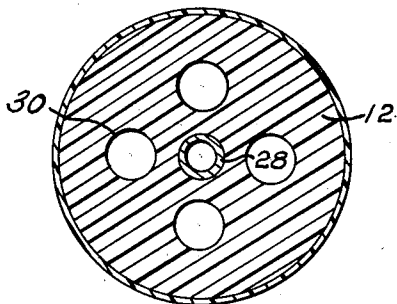


FIG. 4.



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## BOWLING PIN

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1 Claim. (Cl. 273—82)

This invention relates to bowling pins and more particularly to a pin of composite construction.

Bowling pins have generally been constructed of maple; the pins being turned therefrom with the grain running lengthwise. Such pins, unless turned from a heart section are incapable of exhibiting uniform characteristics transversely thereof, and in the course of usage exhibit evidence of failure by reason of the grain being non-uniform. Pins that have been injured are sometimes refinished, tending to reduce the overall size, and the severe shocks imposed have the effect of reducing the diameter of such pins to substandard.

The present invention is directed to a pin formed of homogenous materials exhibiting like characteristics in all directions, or like characteristics at least in all directions transverse of the pin axis. The invention is directed to a pin in which the mid section, tip and base are composed of material best able to withstand the shocks occurring during normal play, and in which intermediate sections are of lighter material, well able to resist the punishment dealt to such pins in the intermediate regions. The invention further contemplates the reinforcement of the pin by a central light tubular spine or core and the usage where desired, of a substantially uniformly thick exterior sheath, supported by the mid section, tip and base portions and the intermediate sections.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claim.

In the drawings wherein like reference characters indicate like parts:

Figure 1 is a side elevation of the pin having an external sheath;

Figure 2 is a longitudinal section through such pin;

Figure 3 is an enlarged fragmentary section of the tip end of the pin; and

Figure 4 is a transverse section taken on the line 3—3 of Figure 2.

In the drawings, the pin 10 is composed of a center section 12, base section 14, and tip section 16, all of which may be of the same material since such sections are subjected to the impact of the bowling ball, or most of the impacts between pins, after a pin or pins have been struck by a ball. The central section 12 comprises a member extending across the pin, the radial section of which is generally of T configuration well filleted, so that impacts received upon the exterior surface 18 will be transmitted through the fillet portions 20 and 22 and transverse web section 24 to the central column or spine 28. The central section may be lightened by having material removed, as is indicated at 30, so that the complete pin will fall within the weight range normally set for such pins. The central

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column will have a close fit in passing through the web section 24.

The tip end section is provided with a rounded exterior of the general contour of the end of a pin, and extends below the region of maximum diameter of the tip end as at 32. The end section has a central bore 34 to snugly receive the end of the column 28. The inner end is recessed as at 36 to receive the end of the intermediate section 38, extending from the center section 12 to the tip section 16.

The base section 14 is provided with an annular face 40, adapted to set upon the alley, such face being slightly rounded as at 42, around its peripheral edge, to minimize contact injury to other pins. The base has a threaded aperture 44 to receive the exteriorly threaded end of the column member 28, and has a generally spherical upwardly facing surface 45 for contact with the intermediate section 46 filling the space between the base section 16 and central section 12. If desired, the base section may have an interlocking groove 48 or grooves into which the end of the intermediate section 46 extends, the same being molded in engagement with the end section with a projection 50 or projections extending in the groove or grooves 48.

The intermediate section 46 is molded or formed with upper and lower end surfaces 52 and 54 that are contoured to exactly mate with the complementary surfaces of the central section 12 and base section 16. The intermediate section 38 at its lower and upper ends 56 and 58, is likewise contoured to exactly mate with the complementary surfaces of the central section 12 and tip section 14, and a suitable binder is introduced between such surfaces so as to render the assembly in effect a solid structure.

Each of the intermediate sections 38 and 46 has a central close fitting bore through which the tubular column 28 extends, and each may have one or more reinforcing discs such as 60 molded integral therewith, and such discs may have a reinforcing flange 62 about their periphery, and apertures 64 in the body portion through which the material of the intermediate sections can flow.

The upper end of the tubular column is internally threaded as at 66, and terminates just short of the external surface of the tip end section 16. The column is provided with a cap 68 having a threaded shank 70 adapted to be screwed into the threaded end of the column 28, and the cap has a head or flange adapted to engage the end of the end section 14. The head of the cap is provided with spanner apertures 71 so that the cap can be drawn tight, and is provided with a lathe center 72. The column, being hollow and open at the bottom is adapted to receive an internal expanding lathe chuck, so that the pin may be mounted for rotation about its axis on a lathe for polishing, truing or any other desirable turning operation.

The contour of the intermediate sections 38 and 46, the central section 12 and tip section 14 may be uniformly less by a fixed amount such as an eighth of an inch, from that of the standard pin external dimensions, in which case the head of the cap will have a like thickness. The pin is then provided with a sheath of material of uniform thickness extending from the shoulder formed by the head of the cap, and that formed by the base member 16. When the sheath is to be formed of material, the bonding of which with the sections 38, 46, 12 and 14 will be promoted by knurling the surfaces as at 74, such surfaces will be knurled, but where the sheath material and sections 12 and 14, 38 and 46 are bonded by interfusion between the sheath and section materials, such surfaces may be smooth.

The sheath may be molded about the assembly of sec-

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tions 12, 14, 38, 46 and 16, and suitably bonded to the section surfaces in the process through the use of an adhesive, cement, or by a bonding action in which fusion takes place at the contacting surfaces. The tip section 14, base section 16, and central section 18 may be formed of ebonite, or a plastic such as cellulose nitrate, which exhibits high shock resistance, while the intermediate sections may be made of lighter plastic such as cellulose acetate, or cellulose acetate butyrate, a common form of which is known as Tenite, while the external sheath may be formed by cellulose nitrate, or ethyl cellulose, the latter being capable of being spray coated. The pin is completed by sizing to shape in a lathe, if its shape is not brought to standard by molding or other process, and polished smooth to present a proper appearance. The sheath may be white, with the base section black. The weight of the intermediate sections can be lightened by including mineral filler such as asbestos or cellulosic or fibrous material.

It will be understood that the hollow column member may be formed of aluminum or aluminum alloy, and that the same being hollow detracts from the overall weight, as do the cavities formed in the central section 12. Weight additions may be made by inserts within the column. It will be appreciated that the central and end sections 12, 14 and 16 require material capable of withstanding severe impacts, and as such are of greater density than that of the material of the intermediate sections 38 and 46.

Although a single embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claim for a definition of the limits of the invention.

What is claimed is:

A bowling pin comprising a central section, in the

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region of greatest pin diameter, a tip section and a base section, said central section having upwardly and downwardly facing concave surfaces, and said tip section having a region of maximum diameter, and a downwardly presented concave surface located therebelow, and intermediate body sections disposed between each of said central sections, and said base and tip sections, and having end faces complementary to and in rigid engagement with the facing surfaces of said central, tip and base sections, said central tip and base sections being composed of a homogeneous composition of high impact strength and of greater density than the composition of said intermediate sections, a sheath of high impact resistant material enclosing said central section, intermediate sections and portions of said base and tip sections, said sheath being bonded to said sections, a hollow tubular member axially extending through all of said sections and threaded internally at its upper end, and means at opposite ends of said member for anchoring said member in the tip and base sections and for drawing all of said sections tight, the said means at the tip end comprising a cap having a head and threaded shank, said head overlying said tip section and having a center and spanner apertures, and said shank being threaded in said tubular member, and said sheath being of a thickness commensurate with said head, and extending over said tip section into contact with said head.

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