Feb. 1, 1966 R. M. CONKLIN ETAL 3,232,616

BOWLING PIN BASE AND PIN INCLUDING SAME

Filed Aug. 8, 1962

Fig. 1.

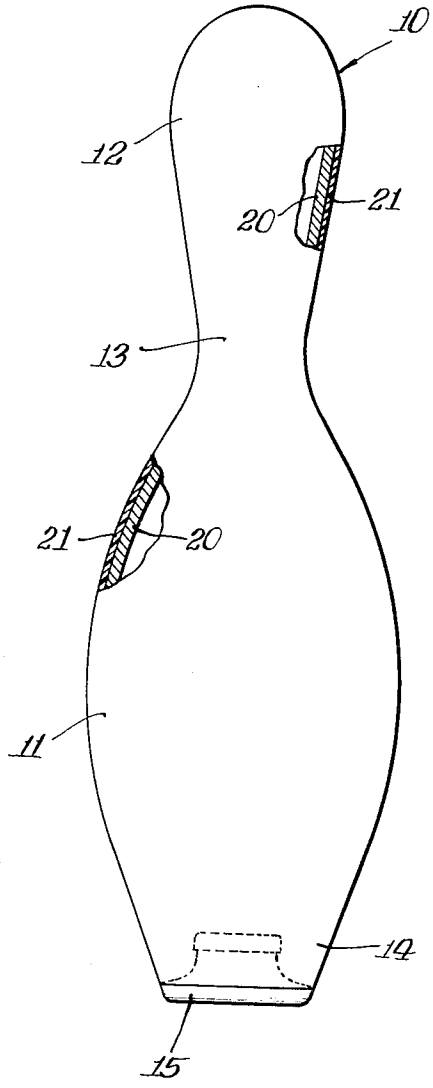
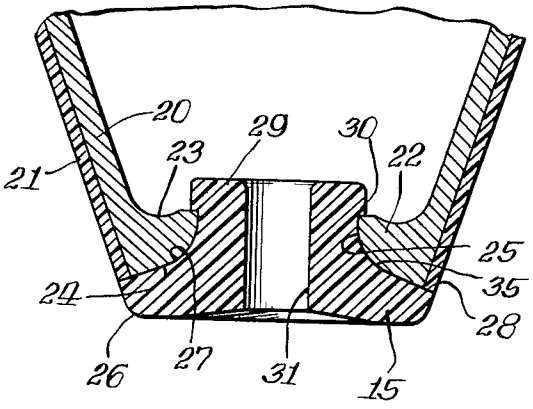


Fig. 2.



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United States Patent Office 3,232,616 Patented Feb. 1, 1966

3,232,616

BOWLING PIN BASE AND PIN INCLUDING SAME

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Filed Aug. 8, 1962, Ser. No. 215,719
3 Claims. (Cl. 273—82)

This invention relates to bowling pins and more particularly to a new and improved pin bottom for a bowling pin.

At the present time, it is common practice to utilize a pin bottom for a bowling pin made out of a plastic material such as nylon which has high impact resistance. However, in certain constructions thereof, the bottom is capable of easily being broken due to side impacts of the bottom against other pins or the bowling alley kickbacks.

It is the primary purpose of this invention to provide a pin bottom and coacting pin construction which spreads out the forces occurring in such side impacts and provides substantial mass across the points of greatest weakness.

An object of this invention is to provide a new and improved bottom for a bowling pin having a longer life due to improved strength thereof resulting from the construction and association with a bowling pin.

Still another object of the invention is to provide a bowling pin with a pin bottom in which the pin bottom is fitted against the bottom of a pin core with the bottom of the core and the upper surface of the pin bottom interengaging and having an upward and inward slope to provide engaging sloped surfaces generally normal to the greater proportion of side loads taken by the pin bottom.

Still a further object of the invention is to provide a construction as defined in the preceeding paragraph in which the core is provided with an aperture and the pin bottom has a plug extending into the aperture and interlocked with the bottom of the core to hold the pin bottom and core in assembled relation.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is an elevational view of the bowling pin with parts thereof broken away to show the construction of the pin; and

FIG. 2 is a fragmentary enlarged vertical section taken through the lower part of the pin.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

The bowling pin is indicated generally at **10** and, as commonly known in the art, has a belly **11** and a head **12** interconnected by a neck **13**. The pin has a base area **14** and the bottom of the pin is defined by a pin bottom **15**. The pin including the belly **11**, head **12**, neck **13** and base **14** are all formed of generally the same construction. This construction may be in the form of a body or core of wood with a coating thereover, however, as shown in the drawings, the pin embodies a hollow core **20** of a suitable metal or metal alloy and an enclosing coating **21** of suitable material.

The core **20** has a bottom wall **22** with this wall having an upper face **23** and a lower face **24**. The bottom wall has an opening **25** defining a central aperture therethrough for receiving a part of the pin bottom **15**.

The pin bottom **15** is formed of a material having high impact resistance such as nylon with the bottom having a lower outer face **26** and an upper face **27** coextensive with and engaging the lower face **24** of the core bottom wall. The bottom has a peripheral part **28** extending beyond the core **20** in order to provide a surface against which a terminal part of the coating **21** may abut to prevent any exposed surface edges.

The pin bottom **15** has an upwardly extending plug portion **29** extending upwardly into and beyond the opening **25** in the core bottom wall. An enlarged end defines a flange **30** to interfit with the upper surface **23** of the core bottom wall adjacent the opening **25** and interlock therewith to lock the pin bottom into assembled relation with the core and coating. As shown, the pin bottom has a central aperture **31**.

In addition to the high impact resistance of the pin bottom, the bottom material has a sufficiently high yield strength to permit temporary deformation of the plug **29** for insertion of the plug into and through the bottom wall opening **25** by a snap action with the flange **30** then interlocking with the core bottom wall. The pin bottom can be held in associated relation with the core merely by the interlocking without any adhesives. The lack of adhesives provides a better cushioning action due to the non-adhesive holding of the bottom to the remainder of the pin.

When the pin bottom is impacted directly against the bottom thereof and axially of the pin, there are normally no significant problems encountered due to the entire bottom face **24** of the core bottom opposing the force. Also, when the impact is generally against the lower side of the base **14** of the pin with some engagement of the peripheral part of the pin bottom, the load is substantially taken by the core and substantially forces are not exterted against the pin bottom and its mounting to the core. A great number of the side impacts are received from directions falling between the two impact directions just described and can result in substantial shear forces acting across the points of greatest weakness which are in the area including the joining of the plug section **29** of the pin bottom to the remainder thereof. In order to spread out these shear forces, the lower face **24** of the core bottom wall is sloped upwardly toward the central aperture **25** and the upper face **27** of the pin bottom is correspondingly sloped at an angle to lie along a line generally normal to the greater proportion of side loads taken by the pin bottom. From tests, it has been found that a suitable range of slops are angles to the horizontal of the lower face **24** of the bottom wall generally within a range of 15°–25° although improved results can be obtained with a wider latitude of angles due to sloping of the lower face **24** providing added surface area for taking up the side impact forces.

Although not limiting the principles of this invention to cores of metal, the problem is more acute when associating the pin bottom **15** with a metal core since the metal core does not have the compressibility of wood.

The upper face **27** of the pin bottom smoothly curvingly blends into the plug section **29** as indicated at **35** which increases the section modulus and contributes to the life of the pin bottom.

We claim:

1. A bowling pin comprising:

(1) a rigid core having a bottom wall with an aperture in the bottom wall; and

(2) a pin base comprising a body member having:

(a) a plug portion,

(b) a peripheral flange portion,

(c) interlock means received by said aperture and locking the base to said core, and

(d) a stress relieving surface sloping upwardly and inwardly from the peripheral flange portion and curvingly merging with the plug portion,

said bottom wall being of a shape mating with the pin base surface.

2. A bowling pin comprising:

(1) a rigid core having a bottom wall with an aperture in the bottom wall; and

(2) a pin base comprising a body member having:

(a) an enlarged peripheral flange portion,

(b) a central plug portion,

(c) an enlarged peripheral upper end of said plug portion forming an interlock element snap-fitted through said aperture and removably locking the base to said core, and

(d) a stress relieving surface sloping upwardly and inwardly from the peripheral flange portion and curvingly merging with the plug portion,

said bottom wall being of a shape mating with the pin base surface.

3. A bowling pin comprising a hollow metal core having an inwardly dished convexly curved bottom wall with a central aperture therethrough, a pin base comprising a plastic body member having a peripheral flange portion, a plug portion terminating at an upper end in a snap-lock element received through said aperture and merging at a lower end through a stress relieving surface sloping upwardly and inwardly from the peripheral flange portion and curvingly merging with the plug portion, said snap-lock element removably locking the base to said core, said bottom wall backing the pin base at the surface of said pin base throughout the entire extent thereof.

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