Dec. 26, 1950 E. W. BERGERE 2,535,033

BOWLING PIN HAVING PLASTIC-IMPREGNATED FABRIC COATING

Filed May 17, 1946

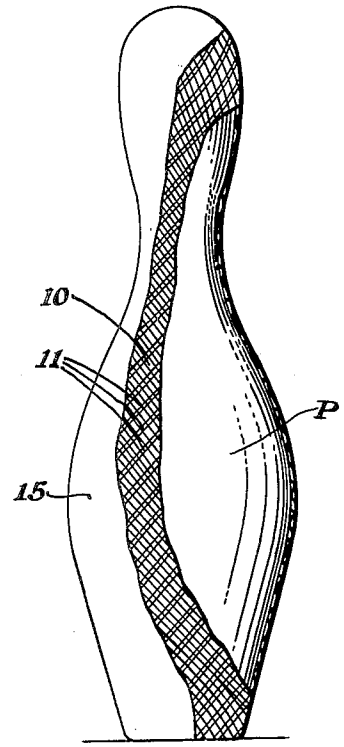


Fig. 1

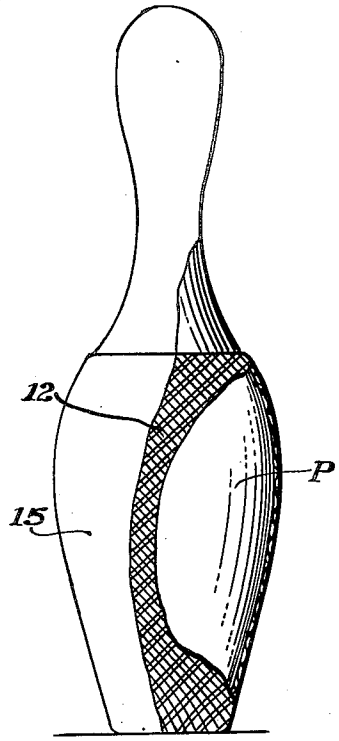


Fig. 2

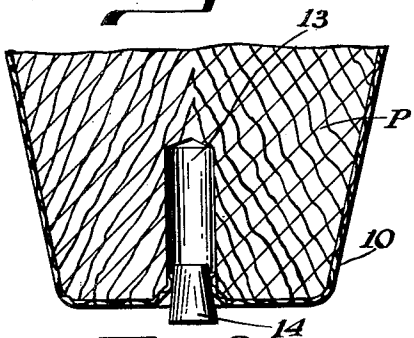


Fig. 3

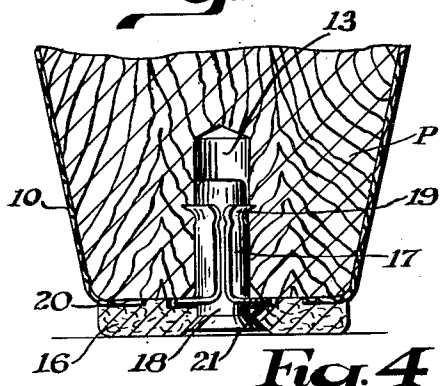


Fig. 4

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Patented Dec. 26, 1950 2,535,033

UNITED STATES PATENT OFFICE

2,535,033

BOWLING PIN HAVING PLASTIC-IMPREGNATED FABRIC COATING

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Application May 17, 1946, Serial No. 670,635

3 Claims. (Cl. 273—82)

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This invention relates to bowling pins and particularly to a novel surface finish for a bowling pin by which its useful life may be prolonged.

It is a well-known fact that the severe concussions which a bowling pin receives soon reduce it to a condition where it is no longer fit for accurate play. The official rules for tournament play, however, prescribe certain dimensions in the diameters of the pins. After 80 to 100 single games, a pin which originally met these specifications will have become so badly marred and splintered, especially in the region of greatest diameter, that it no longer can be used for tournament play. In an ordinary busy bowling alley this number of games corresponds to a period of about a half a week.

The rejected pins are ordinarily reworked on a lathe to a new surface which, of course, is of smaller diameter, and are then repainted and put into open or practice play. Here, again, they become badly splintered and, while some can be reworked a further time, the percentage of discards rises rapidly.

Pins of good quality are quite expensive and, due to the high mortality thereof as just described, they represent one of the major items of expense in a well-run bowling alley. Moreover, the splintered condition of the pins is hazardous for the pin boys, inasmuch as slivers of wood are cracked loose and are sent flying through the air during a game. In addition, the jagged surfaces of the pins are dangerous to handle. Furthermore, the cushioning effect due to the loosened and disintegrated surface of the pin has a deleterious effect on the liveliness and, hence, on the normal and intended action when struck by a ball or by other pins in the play of the game.

Many attempts have been made to provide inserts of various materials in the pins, especially in the regions of greatest shock, but, to my knowledge, none of these has been completely successful nor has been accepted by the official association as allowable in bowling tournament play. In general they alter the characteristic behaviour of the standard hard maple pin, and the composite structures tend to separate under the heavy concussions to which they are subjected.

An object of the present invention is to provide a non-splintering finish for a bowling pin which will maintain the wood beneath it in an intact condition.

This object I accomplish by providing a thin-walled member of a suitable material in a highly

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tensioned condition circumferentially of the pin. This member is cemented or otherwise caused to adhere firmly to the pin and is given an outer coating of pleasant appearance and hard impervious surface. The resulting surface finish deforms with the wood beneath it momentarily under impact and prevents any separation of the wood fibers.

The thin-walled member may comprise the adjacent turns of a filament wound spirally about the pin under tension. I prefer, however, to use a sleeve of suitable material which can be drawn over the pin. Such a sleeve is under greatest tension at the region of largest diameter and it is there that the greatest degree of protection of the pin is desired.

I have found that the three desiderata, namely, a highly tensioned member, a cementing of it to the pin, and a hard, resilient surface, may be effectively and expeditiously obtained by stretching a textile fabric sleeve or stocking over the pin and impregnating it with one or more coats of a suitable material such as a nitro-cellulose lacquer. I am using the term "textile fabric" as meaning any flexible absorbent sheet material made from threads or yarns, whether technically by weaving, knitting or any other means of associating such filaments. As the material dries and hardens, the fabric is shrunk sufficiently to grip the pin tightly and is cemented thereby to the pin while in a highly tensioned condition. The wood becomes bound in a resilient, impervious finish and is prevented from breaking out, while the finish itself withstands repeated blows without ill effect. It is to be noted that the fabric no longer behaves as such in cushioning the surface of the pin but, instead, becomes, in effect, an integral part of the lacquer finish. Thus, the characteristic liveliness of the hard wood pin is unimpaired by my surface treatment.

I have found that pins treated by this method out-live ordinary untreated pins by hundreds of games. In particular, one set of pins which was so treated was, at the end of 300 games, still in excellent condition for further play. While many dents appeared in the surfaces due to the crushing impacts to which the pins had been subjected, there were no breaks in the surfaces. This is to be compared to the 80 to 100 game limit previously mentioned.

Another advantage of this treatment is the preservation of the bright color and, hence, of the visibility of the pins from the bowler's position. In a splintered pin the raw wood is exposed and a dirty brown color is soon obtained

which has a decidedly low degree of visibility. In the case of pins treated according to my invention, the light colored fabric never discolors and gleams brightly throughout its life.

Other objects and advantages will be made apparent by the accompanying description and claims and the appended drawings.

In the drawings, Fig. 1 is a side elevational view of a bowling pin treated according to my invention; Fig. 2 is a similar view showing a modified form of treatment; Fig. 3 is a fragmentary axial section of the pin with the fabric covering in the process of being secured at the base and Fig. 4 is a view similar to Fig. 3 illustrating a modified form of base.

In the preferred form of my invention, illustrated in Fig. 1, I provide a fabric sleeve 10 of sufficient length to envelope the entire pin P. A material which I have found suitable for this purpose is the tubular knitted article which is used as a base for plaster casts about a patient's limb. This is known in the trade as Two-Inch Orthopedic Stockinette and is manufactured by the Adler Company, Cincinnati 14, Ohio. It is made of long staple cotton yarn and, having a close knit elastic rib stitch; it binds closely upon the bowling pin throughout the length of the latter.

I prefer to twist the fabric upon the pin until the ribs 11 lie at an angle of approximately 45° with the axis. I find that this not only causes the fabric to stretch tighter upon the pin, but also allows the pin to spin or skid freely upon the alley when it is knocked down.

It will, of course, be apparent that fabrics of other materials and of other weaves than that above-mentioned may be employed. For example, fabrics of nylon, fortisan, cotton, woven glass, etc., of suitable elastic weaves can be used.

The full length form, illustrated in Fig. 1, not only prevents the wood from breaking out in the region contacted by the bowling ball, but also prevents splitting and chipping of the neck portion. When only the region of major damage is to be protected, I provide a part-length finish, as illustrated in Fig. 2, wherein the fabric envelope 12 extends over the body portion as far as the start of the neck portion.

As illustrated in Fig. 3, the fabric sleeve 11 or 12 is drawn axially inwardly over the base of the pin and the edge is clamped within the usual center hole 13 by means of a tapered plug 14. In knitting special sleeves for bowling pins, the edge can be reinforced so that it will spring around the end of the pin and stay in stretched condition. The fabric at the top of the pin may be gathered and clamped in a manner similar to that shown in Fig. 3 for the bottom.

When the fabric is securely in place, I dip the pin in a nitro-cellulose lacquer which has the property of shrinking the fabric tightly upon the pin. I have found that a lacquer suitable for this purpose is that which is known in the trade as Nitrate Airplane Dope. Such products are used in the aircraft industry where fabric is to be shrunk to a taut condition. Various formulae are used in which cotton linters are nitrated, to various degrees, to form a nitrocellulose which is then incorporated with various percentages of gums, plasticizers, resins, pigments, solvents and diluents. In the fabric lacquer finish of my invention I prefer to use a lacquer which will dry with a high degree of lustre and will be tough and flexible so that it will deform with the wood beneath it during impact.

A lacquer suitable for use in the present invention is that known as United States Government Specification AN–TT–D514, (Amendment #3, September 3, 1944) for Clear Nitrate Dope. The composition of such specification is as follows:

Item	Material	Weight	U. S. Government Specification
		Per cent	
1	Cellulose Nitrate Type 2 (1) (2) (Wet).	10	AN-L-C-181.
2	Cellulose Nitrate Type 4 (1) (2) (Wet).	5	Do.
3	Castor Oil (Min.)	1	AN-JJJ-O-316.
4	Dibutyl Phthalate (Min.) (2) (3)	1	AN-O-D-361.
5	Butyl Alcohol (Normal)	7	AN-O-A-391.
6	Butyl Acetate	15	AN-O-B-841.
7	Ethyl Alcohol	20	AN-O-E-758.
8	Toluene (Max.)	33	AN-R-T-541.
9	Naptha—Petroleum Aliphatic	8	AN-N-3.
		100	

The solid nitrocellulose content has been calculated on the basis of 35% (alcohol) content. The plasticizer should not contain less than 15% or more than 17% of the non-volatile contents.

I have found that a better product is produced by dipping the pin for a number of thin coats rather than for one heavy coat. I commonly give pins seven thin coats and dry each coat with infra-red lamps before applying the succeeding coat. The lacquer, represented at 15 in the drawings, impregnates the fabric, shrinks it to a highly tensioned condition over the grain of the wood, and forms with it an integral finish with a thickness of the order of .025 inch. Bowling pins have heretofore commonly been treated with a number of coats of some form of pin lacquer and it will, therefore, be noted that the surface finish of my invention introduces no undesirable change in the characteristics of the pin in play.

Where wooden plugs 14 are used to hold the fabric edge, such plugs are removed when the final coat has been dried and the bowling pin is then ready for use. By extending the fabric around the bottom of the pin the corner of the pin is prevented from chipping and rounding. Damage to the corner of the pin prevents it from standing up in a satisfactory manner as a result of which the pin must frequently be trimmed and thereby reduced in height. Usually trimming the bottom reduces the height of the pin by ¼ of an inch, but after a pin has been trimmed and the hard seasoned surface has been cut, the pin does not stand up as well as prior to the first trimming. I have found that the surface of a trimmed pin will chip badly in about ten lines of play and after about thirty to forty lines of play, it is necessary to retrim the bottom again. With the present invention, the corners stand up, the bottoms remain flat and the pins are not scarred from impact with a sharp corner.

In Fig. 4 is shown an alternative treatment for the base of the pin in which a renewable member 16, in the form of a fiber or impregnated fabric washer, is provided. The washer may be secured to the pin by means of a separable fastener comprising a tubular portion 17 and a rivet or stud 18. The tubular member may be placed in the hole 13 of the pin, and the rivet, when driven through it, expands it to force the sharp edges 19 into the wood. A fastener of this type is illustrated in Letters Patent No. 2,400,142 issued to George A. Tinnerman on May 14, 1946, but it will be understood, however, that other types of

fasteners may be used. The washer 16 is rabbeted at 20 to accommodate the lower portion of the surface finish, and is counterbored at 21 to accommodate the flange of the tubular member 17.

I have found that my surface treatment may be employed to advantage not only on new pins but also in restoring old pins to usable condition. Pins which have been in use for a substantial length of time become reduced in diameter, by the crushing blows, to such an extent that they no longer can be gripped in the pin-setting rack. This reduction in diameter commonly occurs at the zones on the pin which are contacted by the ball and which strike the floor when the pin is toppled over. These zones can be built up to specified diameter, and the original contour of the pin thus restored, by winding tightly with a strip of gauge bandage which is then impregnated with nitro-cellulose lacquer as above-described.

I claim:

1. In combination, a bowling pin, a surface finish therefor comprising an envelope of elastic rib-stitched fabric stretched tightly about the pin, the ribs of the fabric extending spirally around the pin, and one or more coats of a nitrocellulose lacquer applied to the fabric.

2. In combination, a bowling pin, a surface finish therefor comprising a sleeve of elastic fabric stretched tightly over the pin, a central hole in the base of the pin, a lower edge on said fabric stretched radially inwardly across the base of the pin and extending into the hole, and one or more coats of a nitrocellulose lacquer impregnating the fabric.

3. In combination, a bowling pin, a surface protecting finish therefor comprising a sleeve of elastic fabric stretched tightly over the pin, a central hole in the base of the pin, a lower edge on said fabric extending radially inwardly partially across the base of the pin, a base protecting member beneath the pin, an annular rabbet on said member accommodating the fabric edge, and a separable fastening means extending through said member into said hole.

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