Oct. 9, 1973 V. E. DWORAK 3,764,435

METHOD OF EMPLACING INSIGNIA IN OBJECTS

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FIG. 1

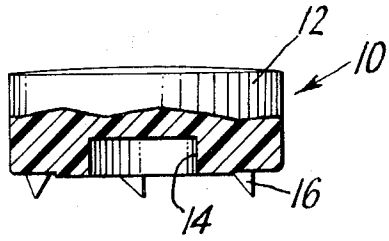


FIG. 2

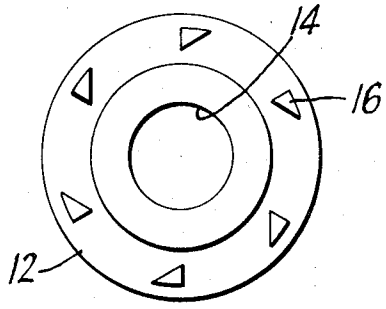
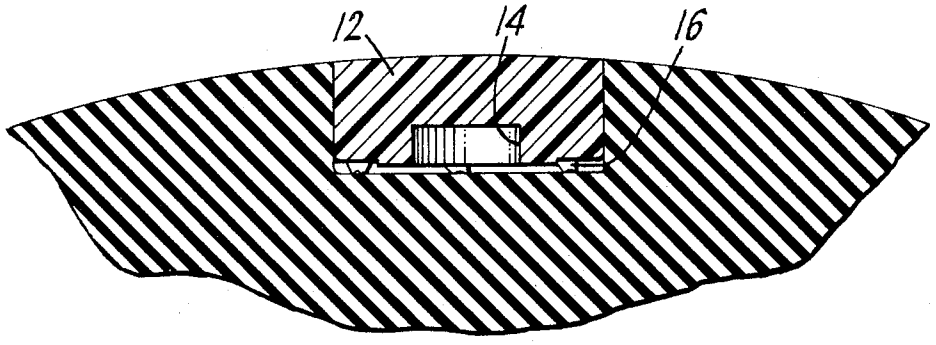


FIG. 3



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FIG. 4

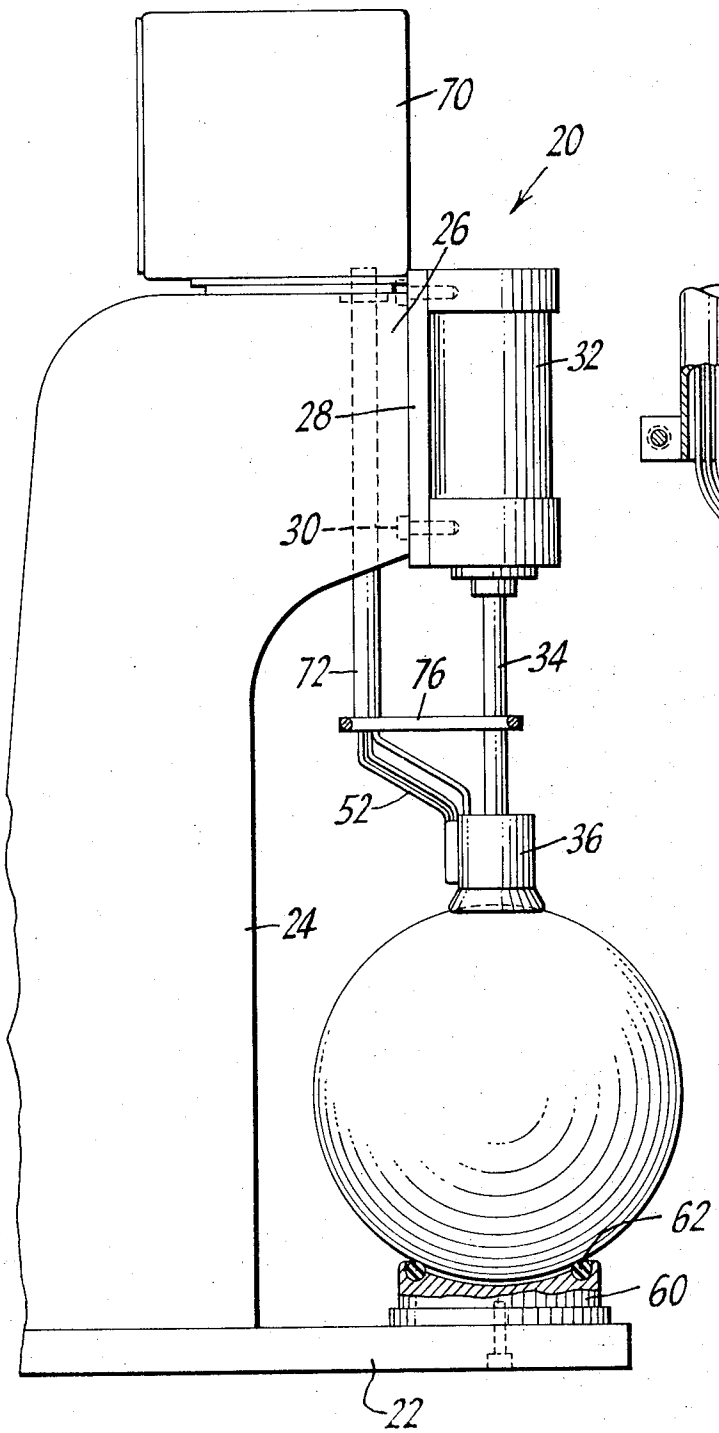
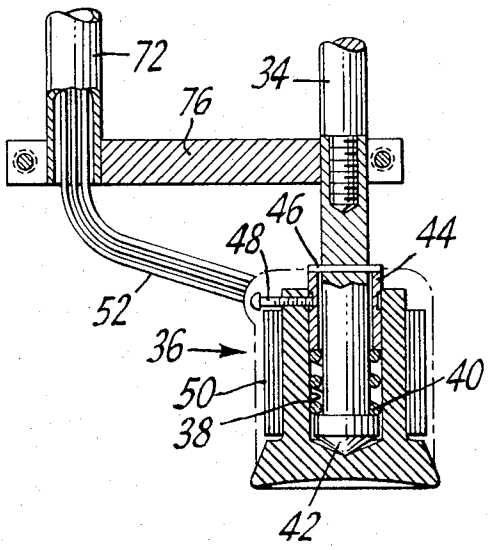


FIG. 5



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METHOD OF EMPLACING INSIGNIA IN OBJECTS

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U.S. Cl. 156—257 1 Claim

ABSTRACT OF THE DISCLOSURE

The method of decorating an object comprising the steps of providing a recess in a finished object, emplacing a marking plug of variable height in said recess, and conforming the upper surface of said plug to the outer surface of the object.

BACKGROUND

This invention relates to the decoration of objects and more specifically to the fabrication of bowling balls having derocative features therein.

In the manufacture of bowling balls, all balls are ground and buffed finished. At this finished stage they are graded and categorized into groups. The groupings are generally made in accordance with size and weight block tolerances, with a separate model designation being accorded to each group. After the model groupings of the balls have been made, the balls in each model group are given characterizing indicia designs. Often, these indicia are derocative plugs made of plastic or the like that are placed in recesses drilled in the buffed balls.

Since the final grouping cannot be made until subsequent to the final grinding and buffing operations, it is necessary to provide a method of emplacing indicia marks on the surface of the bowling ball that do not disturb the buffed finish just applied.

SUMMARY

It is, therefore, an object of this invention to provide a method of surface indicia in a bowling ball without marking the surface finish thereof.

It is a further object of this invention to provide a method of providing a surface indicia to a bowling ball wherein the surface indicia article is of adjustable height so as to adjust for varying recessed depths in the bowling ball.

In accordance with these and other objects a method according to the invention may comprise the steps of finish buffing an object, providing a recess in the surface thereof, emplacing an indicia marking plug of variable height in said recess and conforming the upper surface of said plug to the outer surface of said object.

DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevation view of a decoration plug according to the invention with a portion thereof broken away.

FIG. 2 is a bottom view of the decoration plug shown in FIG. 3 with a portion thereof broken away.

FIG. 3 is a sectional view of a bowling ball showing the decoration plug emplaced therein.

FIG. 4 is a side elevation view of a fixture for providing the method of the instant invention.

FIG. 5 is an enlarged side view of a portion of the fixture shown in FIG. 4 with portions thereof broken away.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the practice of a preferred method according to the invention a finished bowlnig ball is drilled to a predetermined diameter and depth by conventional means (not shown).

While the diameter of the recess drilled in the surface of the ball can be easily set and precisely held for each oepration, it is more difficult to precisely effect the same depth for a recess in each ball.

Accordingly, when it is desired to emplace a decoration plug in the recess, it has been found to be necessary to provide some method to assure that the outer surface of the decoration plug is flush with and conforms to the outer surface of the ball. Previously, it had to be done by refinishing the entire ball to insure the necessary roundness.

With reference to the drawings, a sample decoration plug **10** for use in the method according to the invention comprises a generally cylindrical body **12** made of injection molded ABS or other like material, a recess **14** in the bottom surface thereof and a plurality of a saw-tooth-irregular tetrahedron shaped legs **16** provided in the periphery of the bottom of the decoration plug.

In the practice of the method, a cavity or recess of desired shape is provided in the surface of the ball. An adhesive agent, such as epoxy glue, is then placed in the bottom of the recess. A decoration plug **10** of desired configuration is then placed in the recess. The upper surface of the decoration plug preferably conforms to the curvature of the ball.

The ball is then placed in the fixture **20** shown in FIGS. 4 and 5. That fixture includes a stand **22** having a pair of upright members **24** mounted thereon which include a cantilevered portion **26** at the top thereof. A bracket **28** mounted to the cantilevered portions **26** by screws **30** supports a double acting air cylinder **32** in a vertical attitude. A piston rod **34** extends downwardly from the cylinder **32** and includes a plunger member **36** at the end thereof. The plunger member is made of aluminum or like heat conducting material and includes a recess **38** therein for receiving the end of the piston rod **34**. A spring **40** is mounted between the enlarged end **42** of the piston rod and a collar **44** mounted to the piston rod by a roll pin **46** and a screw **48**. This arrangement allows the plunger member to swivel on the piston rod **34** about the point of the enlarged end thereof **42** so that the plunger may adapt itself to the curvature of the ball if the piston rod is not in alignment with the center of the ball. A band heater **50** surrounds the aluminum of the plunger for supplying heat thereto. Wiring **52** supplies power to the band heater and includes a thermocouple for controlling the temperature thereof.

A ball support tray **60** is mounted on stand **22** in spaced relationship with plunger **36**. A resilient ring shaped member **62** is mounted in the tray **60** and engages the ball resting thereon as shown in FIG. 4. The ball is positioned on the tray such that a decoration plug placed in a recess along with epoxy glue is in spaced relationship with the plunger member **36**.

A control unit **70** is mounted on the top of the upright members **24** for controlling the cycle of the operation and the temperature provided at the plunger **36**. A hollow tube **72** depends from the control unit and transmits wiring **52** down to a position adjacent the plunger to which it is attached. The tube **72** also supports a bracket **76** that spaces the tube from the piston rod **34** and thus positions the end of the wiring **52**.

In operation, the ball having a decoration plug and epoxy glue in the recess therein is placed on the tray **60**. The cycle is started by pressing a button (not shown) on the control units. This lowers the plunger **36** into contact with the decoration plug and ball. The pressure applied by the plunger presses the plug into the recess until the outer surface thereof is flush with the surface

of the ball. The provision of legs **16** on the plug permits this to be readily accomplished since the legs collapse under the pressure of the plunger to an extent necessary to make the top of the plug flush with the ball. The pressure is maintained long enough to allow the heat to cure the epoxy glue sufficiently to secure the plug in position. This is about three minutes when the plunger is heated to 200° F. and applied to the ball and plug with a pressure of approximately 120 p.s.i.

The area around the plug is then buffed to remove any marks caused by the operation. Of course, this operation can be done as many times as desired on a given ball to obtain any design pattern.

Having now fully set forth both structure and operation of preferred embodiments of the concept underlying the present invention, it may be that various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will occur to those skilled in the art upon becoming familiar with said underlying concept. All such embodiments, variations and modifications as incorporate the spirit of the invention and depend upon its underlying concept are consequently to be considered as within the scope of the claims appended herebelow, unless the claims by their language expressly state otherwise.

I claim:

1. A method of affixing a plastic material decorative plug to a plastic material finished bowling ball comprising the steps of first forming a cylindrical recess in the surface of said ball, then inserting a thermosetting adhesive in said recess, then inserting a snug solid cylindrical plug into said recess; said plug having a top exterior surface curvature matching that of the ball, a recess at the bottom thereof for excess adhesive, and frangible integral bottom portions whereby the height of said plug including said frangible portions exceeds that of said recess; and then applying pressure to said plug to crush siad frangible portions against the bottom of said recess until the exterior surface curvature of said plug is aligned with the exterior surface of said ball as a continuation thereof, and applying heat to said plug to cure said adhesive to bind said plug to said ball.

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