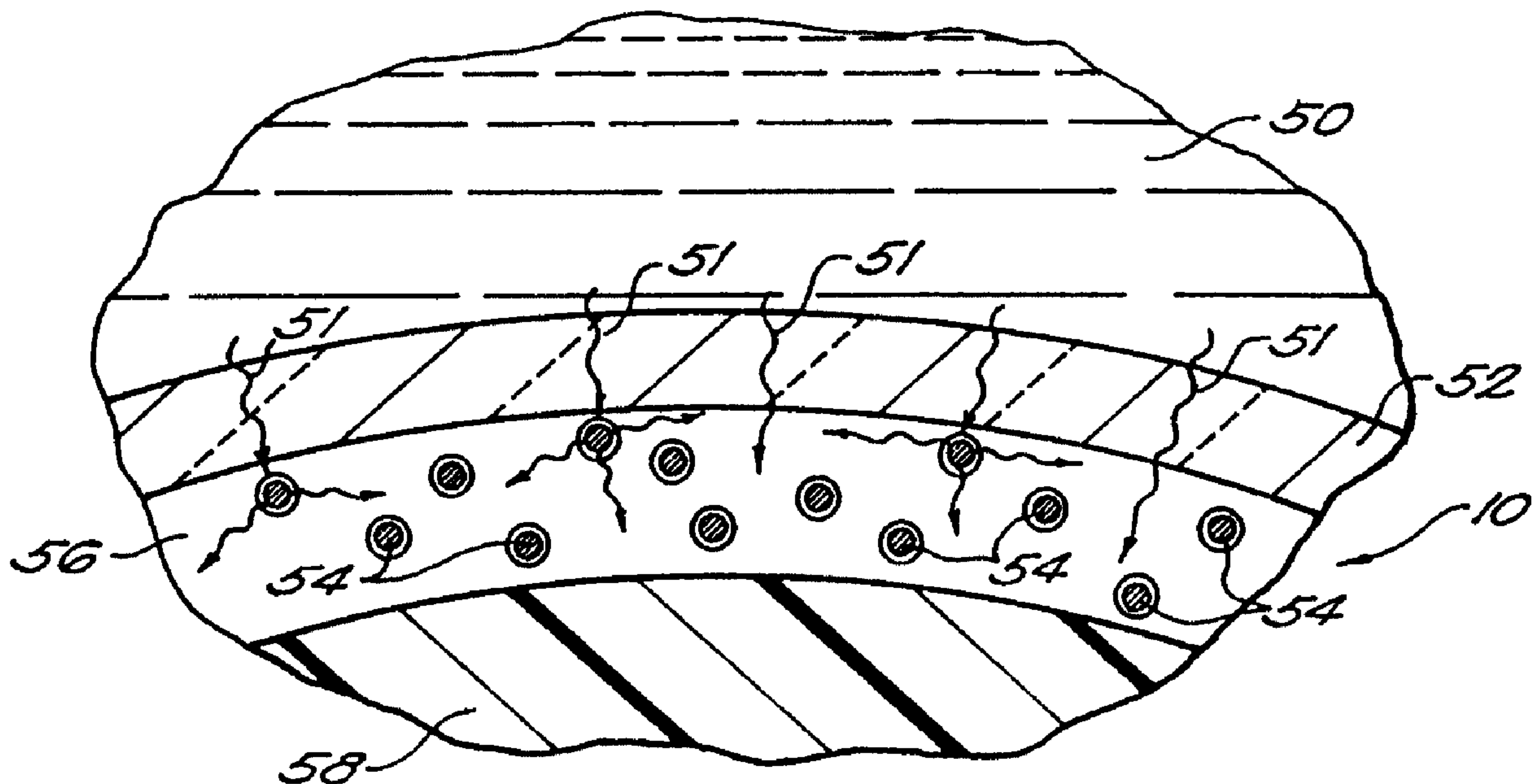




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(54) Titre : INDICATEUR D'IMMERSION POUR BALLE DE GOLF
(54) Title: GOLF BALL IMMERSION INDICATOR

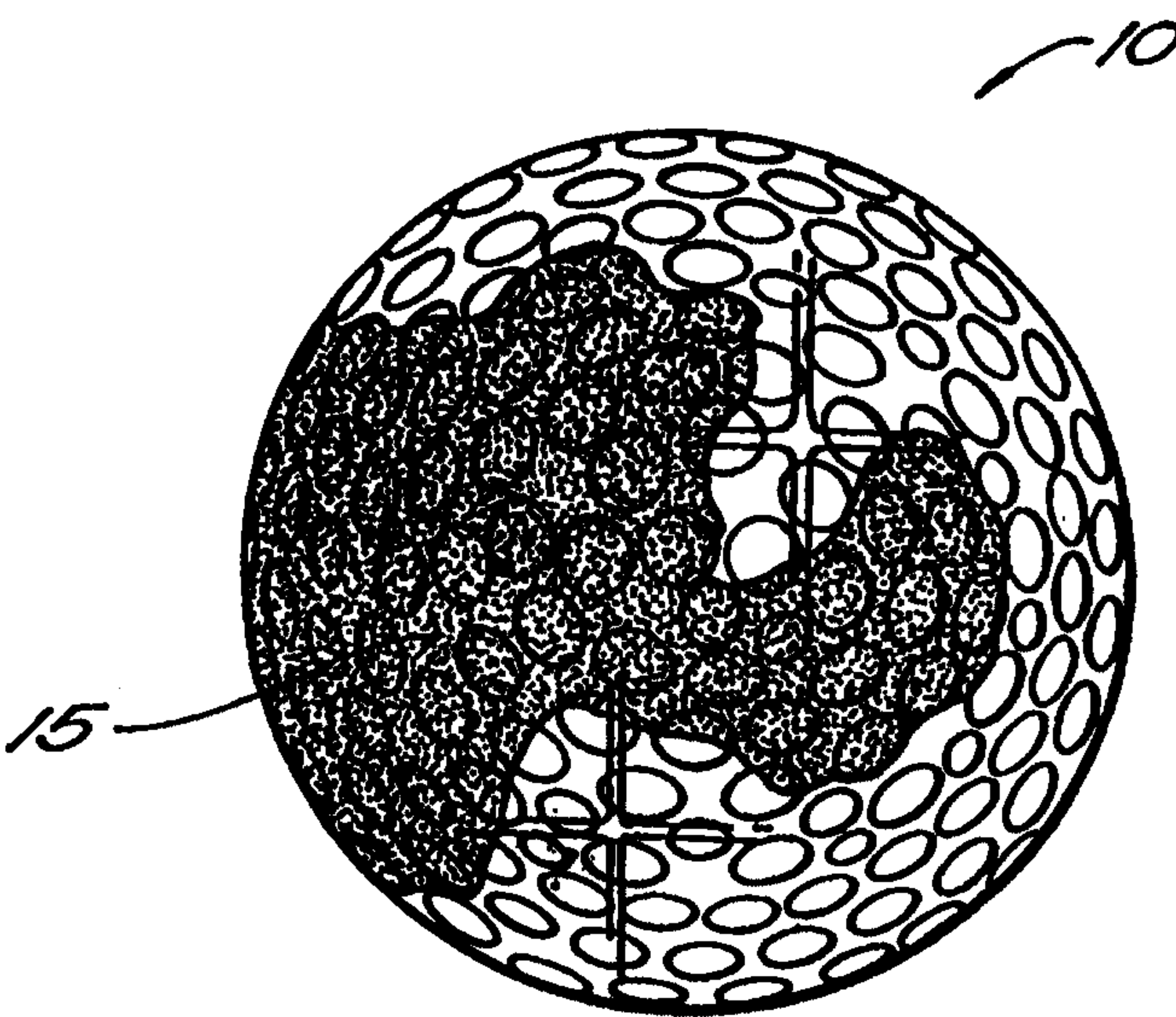


(57) Abrégé/Abstract:

A golf ball (10) is provided which changes color or other indicia (15) after significant immersion in water (50) to indicate that the ball (10) has been recovered from a water hazard and may not have predictable flight characteristics which may result in loss of carry and roll. In one embodiment, a microencapsulated dye layer (16) is formed immediately below the final gloss coat (20) with controlled dye release causing a stained look to the ball after significant immersion in water.

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(21) International Application Number: PCT/US98/17782 (22) International Filing Date: 27 August 1998 (27.08.98) (30) Priority Data: 08/943,584 3 October 1997 (03.10.97) US (71) Applicant: PERFORMANCE DYNAMICS, LLC [US/US]; 195 South Main Street, Middleton, MA 01949 (US). (71)(72) Applicant and Inventor: WINSKOWICZ, Robert, T. [US/US]; 6 Walker Road #5, North Andover, MA 01845 (US). (74) Agent: TENDLER, Robert, K.; 65 Atlantic Avenue, Boston, MA 02110 (US).		(81) Designated States: AU, CA, CN, JP, KP, KR, SE, SG, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: GOLF BALL IMMERSION INDICATOR (57) Abstract A golf ball (10) is provided which changes color or other indicia (15) after significant immersion in water (50) to indicate that the ball (10) has been recovered from a water hazard and may not have predictable flight characteristics which may result in loss of carry and roll. In one embodiment, a microencapsulated dye layer (16) is formed immediately below the final gloss coat (20) with controlled dye release causing a stained look to the ball after significant immersion in water. 		

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the immersion. The problem therefore becomes one of being able to determine when a golf ball has been immersed so that it may be rejected in favor of a new golf ball.

Note that golf ball construction is shown in the following U.S. patents: 5,609,953; 5,586,950; 5,538,794; 5,496,035; 5,480,155; 5,415,937; 5,314,187; 5,096,201; 5,006,297; 5,002,281; 4,690,981; 4,984,803; 4,979,746; 4,955,966; 4,931,376; 4,919,434; 4,911,451; 4,884,814; 4,863,167; 4,848,770; 4,792,141; 4,715,607; 4,714,253; 4,688,801; 4,683,257; 4,625,964; 4,483,537; 4,436,276; 4,431,193; 4,266,772; 4,065,537; 3,784,209; 3,572,722; 3,264,272.

SUMMARY OF INVENTION

In order to alleviate the problem of having to deal with balls which may have been immersed and recovered, in the subject invention a golf ball is provided which changes color or has some other indicia which changes after immersion to indicate that the ball has been immersed.

In the present invention, in one embodiment, encapsulated dyes are utilized as a means of creating a golf ball which irreversibly changes its color when it is exposed to water for long periods of time. The invention is thus used as an indicator of balls previously exposed to water for one to several days in the bottom of a lake, pond, pool or other body of water. Such an indicator is used to alert golfers to potential changes in ball properties due to long water exposure times.

In one embodiment, the composition of the golf ball is that of traditional two or three piece golf balls. A two piece golf ball is one with a solid rubber core and an outer shell made from a hard resin such as an ionomer resin. Three piece balls are those consisting of a solid or liquid core material, a wound

or molded rubber outer core, and an in ionomer or polybutadiene or poly trans isoprene rubber shell referred to as balata ball. In both cases, in one embodiment, the encapsulated dye is included in an overcoating of polymer resin containing the dye encapsulant, followed by a final gloss coating. Alternatively, the dye may be blended, either directly or in an encapsulated form, with the golf ball balata or ionomer shell and a single gloss coating may be added. In both cases, diffusion of water through the gloss coating, followed by diffusion through the encapsulant overcoating or the shell, initiates slow diffusion of a water soluble dye from the microencapsulated particles. The water soluble dye gradually colors the ionomer or polybutadiene shell, leaving a permanently stained ball. The time frame for diffusion may be tailored by adjusting the thickness of the polymer film coatings and the type and size of the polymer microencapsulant, dye and the gloss coatings used.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the subject invention will be better understood when taken in conjunction with the Detailed Description the Drawings of which;

Figure 1 is a diagrammatic illustration of a golfer hitting a golf ball into a water hazard;

Figure 2 is a diagrammatic illustration of the ball of Figure 1 after immersion in water, showing a visual indicator that the ball has been immersed in water for an extended period of time;

Figure 3 is a diagrammatic illustration of a two piece ball which provides a visual indicator of elongated water immersion in which the ball includes a solid rubber core and a hard molded shell of an ionomer or ionomer blend such as Surlyn™ or a similar appropriate polymer resin, with the ball being provided with a

conformal overcoat polymer dispersion containing encapsulated dye particles that goes over the shell or mantle of the ball, and with this overcoat then being covered with a final gloss coat containing no dye particles to maintain a high gloss finish and provide an additional diffusion barrier on the ball to prevent dye release in humid or moist environments;

Figure 4 is a diagrammatic illustration of a three piece ball which provides a visual indication of elongated water immersion in which the ball includes a solid, liquid or gel, a wound rubber band or molded rubber outer core and a shell of a glossy rubbery material such as balata rubber, polybutadiene blends or low shore hardness ionomer and an additional overcoat layer of polymer/encapsulated dye underneath the gloss final coat;

Figure 5 is a schematic diagram depicting diffusion of water into the ball when it is immersed in a body of water for long time periods;

Figure 6 is a diagrammatic representation of an encapsulated dye particle; and,

Figure 7 is a diagrammatic illustration of another type two piece golf ball.

DETAILED DESCRIPTION

Referring now to Figure 1, in a typical situation, a ball 10 has been hit by a golfer 12 into a water hazard 13, where it resides until it is plucked out either by the golfer or by a company which retrieves golf balls from water hazards. It will be appreciated that, as mentioned before, such balls when immersed for a long period of time lose their flight characteristics, and regardless of their being washed and resold, will not regain these characteristics due to the immersion.

