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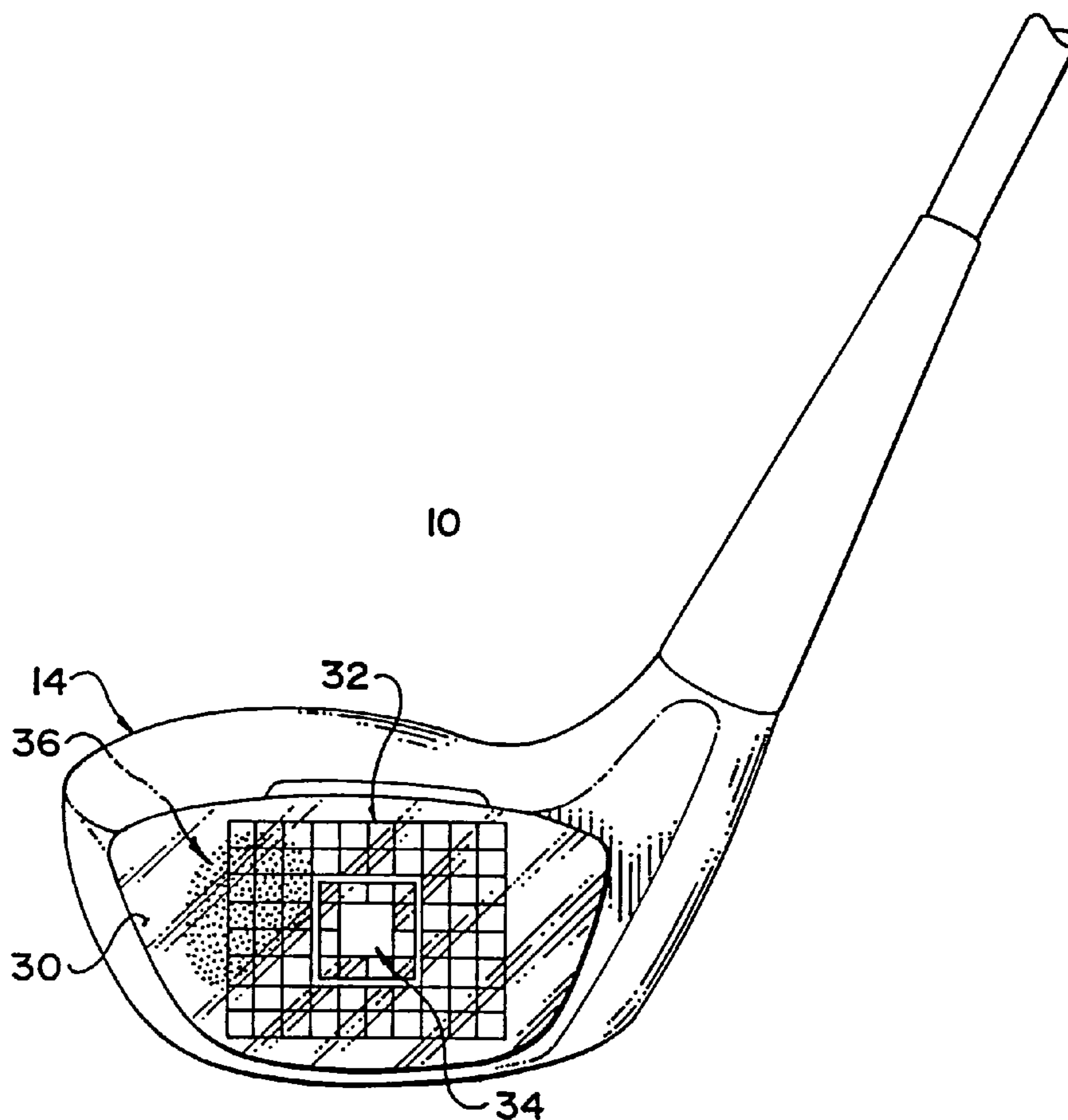
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(54) **INDICATEUR D'IMPACT POUR BATON DE GOLF**

(54) **GOLF CLUB STRIKE INDICATOR**



(57) A self-adhesive sticker or decal which adheres to a golf club face to provide an indication of the point of impact of the golf ball on the club face is provided. It consists of a sandwich of various layers -- a layer of pressure-sensitive adhesive on the bottom, followed by a layer of energy-absorbing elastomeric material on which is provided a film of a temperature sensitive liquid crystal, followed by a top layer of textured clear high impact plastic. Unlike the prior art golf aids, the device is simple and durable so that it can be used repetitively.



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GOLF CLUB STRIKE INDICATOR

Abstract of the Disclosure

A self-adhesive sticker or decal which adheres to a golf club face to provide an indication of the point of impact of the golf ball on the club face is provided. It consists of a sandwich of various layers -- a layer of pressure-sensitive adhesive on the bottom, followed by a layer of energy-absorbing elastomeric material on which is provided a film of a temperature sensitive liquid crystal, followed by a top layer of textured clear high impact plastic. Unlike the prior art golf aids, the device is simple and durable so that it can be used repetitively.

GOLF CLUB STRIKE INDICATORTechnical Field

5           The invention relates to golfing aids, and more particularly to devices for identifying and indicating the location on the club face which is struck by the golf ball.

Background Art

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Numerous aids are available to assist the golfer in improving his or her golf stroke. For example, it is useful to the golfer to be able to identify the location on the club face struck by the ball so that the golfer can modify his or her stance, grip or swing to improve the location to result in greater distance or avoid hooking or slicing shots. As with tennis racquets, golf club heads have a "sweet spot" which is the optimum location for striking the ball to provide maximum distance and accuracy.

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One golfing aid which assists in determining the location of impact of the golf ball on the club head in a golfer's stroke is disclosed in U.S. patent no. 4,826,173 - Brown. It provides a hook and loop fastener, one component of which covers the club face and the other component of which is made into a ring to form the "ball". When the club strikes the "ball" the "ball" sticks to the club face to indicate the impact location. This apparatus however does not reproduce the striking of an actual golf ball to allow the mimicking of an actual golf shot.

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Another prior art device is disclosed in United States patent no. 4,898,389 Plutt. This device uses an array of electronic transducers attached to the club face to sense the impact of the ball and communicate electric signals to a processor which displays the point of impact electronically. Such a device is sufficiently expensive to produce and difficult to use to discourage widespread acceptance. A simpler device is disclosed in United States patent no. 5,033,746 - Jones. This patent discloses a device for marking the point of impact of a golf ball on

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the face of a golf club. It comprises an outer translucent sheet of one colour which is connected to an underlying sheet of a contrasting colour. There is a layer of pressure sensitive adhesive between the two sheets such that the  
5 impact of a golf ball causes the two sheets to adhere and the colour of the underlying sheet to show through the translucent sheet in the area of impact. This device has been found to deteriorate after the impact and leave an imprecise impression of the impact location.

10 Consequently there is a need for a golf club strike indicator which is inexpensive to produce, easy to apply and remove, can be re-used numerous times and provides an accurate impression of the impact location of the golf ball on the club face.

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#### Disclosure of Invention

The invention provides a self-adhesive sticker or  
20 decal which adheres to the club face. It consists of a sandwich of four layers -- a layer of pressure-sensitive adhesive on the bottom, followed by a layer of high-hysteresis (energy-absorbing) elastomeric material on which is provided a film of a temperature sensitive liquid crystal,  
25 followed by a top layer of textured clear high impact plastic.

#### Brief Description of Drawings

30 In drawings which illustrate an embodiment of the invention:

Fig. 1 is a perspective view of a driver head;  
Fig. 2 is a perspective view of the invention, partially exploded;  
35 Fig. 3 is a perspective view of the invention applied to a driver head;

Fig. 4 is a perspective view of the invention applied to an iron head; and

Fig. 5 is a perspective view of the invention applied to a driver head, after impact with a golf ball.

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Best Mode(s) For Carrying Out the Invention

A golf club shown in Figure 1, in particular a driver 10, has a shaft 12 to which is attached a club head 14 of wood, metal or composite material. Club head 14 has a face 16 on which are cut slots or grooves 18 to impart spin to the ball. Club head 14 also has a heel 20, toe 22 and sole 24.

The invention 30 is shown applied to the face 16 of the driver 10 in Figure 3 and the face 46 of an iron 40 in Figure 4. It has printed on its surface a grid such as that shown as 32 to guide the golfer to the preferred location 34, or sweet spot, for a particular club head. Figure 5 illustrates the appearance of the invention on the club face after striking a ball, with a darkened area 36 indicating the area of impact of the golf ball on the club face. The golfer will then refer to written material or an instructor to determine the necessary changes in stance, grip, etc. to improve the impact location.

The structure of the invention is illustrated in Figure 2. The top layer 31 consists of a textured clear plastic, such as a high impact polystyrene or LEXAN<sup>TM</sup>, of a thickness on the order of 7 to 10 mil (.007 to .01 inches or about 180 to 250 microns). This top layer 31 will have grid 32 printed or etched onto its outer surface. Alternatively grid 32 could be printed or etched on the lower surface of layer 31, or the upper surface of layer 33. Top layer 31 should be a high impact plastic so it is sufficiently durable to withstand the mechanical abuse of repeated striking by a golf ball. It is textured in order to provide sufficient friction to impart spin to the golf ball.

Layer 31 is adhered to underlying layer 33 by a contact cement. Layer 33 is a layer of high-hysteresis (energy-absorbing) elastomeric foam, such as that sold under the trade-mark ENSOLITE, of a thickness 1/16 in.- 1/8 in., depending on the club for which the indicator is designed. A thicker foam layer of up to 3/32 in. will be useful for putters. Applied to the upper surface of layer 33 is a backing layer of black paint of 1-2 mils in thickness on top of which is applied a film of a temperature sensitive liquid crystal, such as that manufactured and sold under the trademark THERMAX by Thermographic Measurements Ltd. of South Wirral, United Kingdom. This should be a dual range temperature sensitive liquid crystal film having a temperature response in the range 10 degrees C. to 70 degrees C. with the preferred range covering 15 degrees C. to 45 degrees C. Such temperature sensitive liquid crystal films change through a range of colours as a function of temperature change. The layer of temperature sensitive liquid crystal film may be applied to elastomer layer 33 for example by screen printing.

A layer of pressure sensitive adhesive, having a relatively low level of adherence, is applied to the lower surface 35 of layer 33. A peel-off coated paper layer 37 is provided over the pressure sensitive adhesive to cover the adhesive until the device is attached to the club head.

To use the device, the paper layer 35 is peeled off and the device 30 is stuck to face 16 of club 10, as shown in Figure 3, by applying the pressure sensitive adhesive surface of the device to the club face. The golfer then strikes the golf ball with the desired stroke. a portion of the energy of the impact of the golf ball on the club face will be converted to thermal energy by the energy-absorbing elastomer layer 33 and is conducted to the liquid crystal film. The resulting temperature rise in the temperature sensitive liquid crystal film is temporarily displayed as a localized colour display, shown as 36 in

Fig. 5. The display will disappear in 5 to 10 seconds as the temperature differential disappears.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

## WHAT IS CLAIMED IS:

1. A device for providing a temporary indication of the area of impact of a ball, such as a golf ball, on a ball-striking face, such as a golf club face, said device having an inner surface for adherence to said ball-striking face and an outer impact surface, said inner surface of said device comprising means for removably securing said device to said ball striking face, characterized in that said device further comprises:
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- a) a sheet of light transmitting, hard, durable material sized to fit on said ball-striking face, having first and second surfaces, said first surface forming said outer impact surface of said device; and
  - 10 b) a layer of thermochromic material provided on said second surface of said sheet of light transmitting, hard durable material, wherein said thermochromic material is adapted to reversibly change colour in response to the impact of a ball on said first surface.
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2. A device for providing a temporary indication of the area of impact of a ball, such as a golf ball, on a ball-striking face, such as a golf club face, said device having an inner surface for adherence to said ball-striking face and an outer impact surface, said inner surface of said device comprising means for removably securing said device to said ball striking face, characterized in that said device further comprises:
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- a) a sheet of light transmitting, hard durable material sized to fit on said ball-striking face, having first and second surfaces, said first surface forming said outer impact surface of said device;
  - b) a sheet of energy-absorbing elastomeric material having an outer and an inner surface and sized to fit on said golf club face; and
  - 25 c) a layer of thermochromic material sandwiched between

said second surface of said sheet of light transmitting, hard durable material and said outer surface of said sheet of energy-absorbing elastomeric material wherein said thermochromic material is adapted to reversibly change colour in response to the impact of a ball on said first surface.

3. The device of claims 1 or 2 wherein said layer of thermochromic material is a layer of temperature sensitive liquid crystal.

4. The device of claim 3 wherein said temperature sensitive liquid crystal has a temperature response in the range 5 degrees C. to 40 degrees C.

5. The device of claims 1 or 2 wherein said sheet of light transmitting, hard durable material is a high impact plastic.

6. The device of claims 1 or 2 wherein said means for removably securing said device to said ball striking face comprises a layer of pressure sensitive adhesive.

7. The device of claim 6 further comprising a removable flexible protective sheet adhered to and covering said layer of pressure sensitive adhesive.

8. The device of claims 1 or 2 further comprising a light absorbing layer between said layer of thermochromic material and said means for removably securing said device to said ball striking face.

9. The device of claim 8 wherein said light absorbing layer is black.

10. The device of claim 8 wherein said light absorbing layer is a dark paint.

11. The device of claim 2 further comprising a light absorbing layer between said layer of thermochromic material and said

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means for removably securing said device to said ball striking face wherein said light absorbing layer is adhered to said outer surface of said sheet of energy-absorbing elastomeric material.

12. The device of claim 2 wherein said means for  
5 removably securing said device to said ball striking face comprises a layer of pressure sensitive adhesive provided on said inner surface of said sheet of energy-absorbing elastomeric material.

13. The device of claim 2 wherein said sheet of energy-  
absorbing elastomeric material is a high hysteresis elastomeric foam  
10 having a thickness in the range 0.8 mm to 3.2 mm.

14. The device of claims 1 or 2 wherein said sheet of light transmitting, hard durable material is provided with markings to locate a preferred area of impact for a predetermined ball-striking face.

15. The device of claims 1 or 2 wherein said sheet of light  
15 transmitting, hard durable material is textured.

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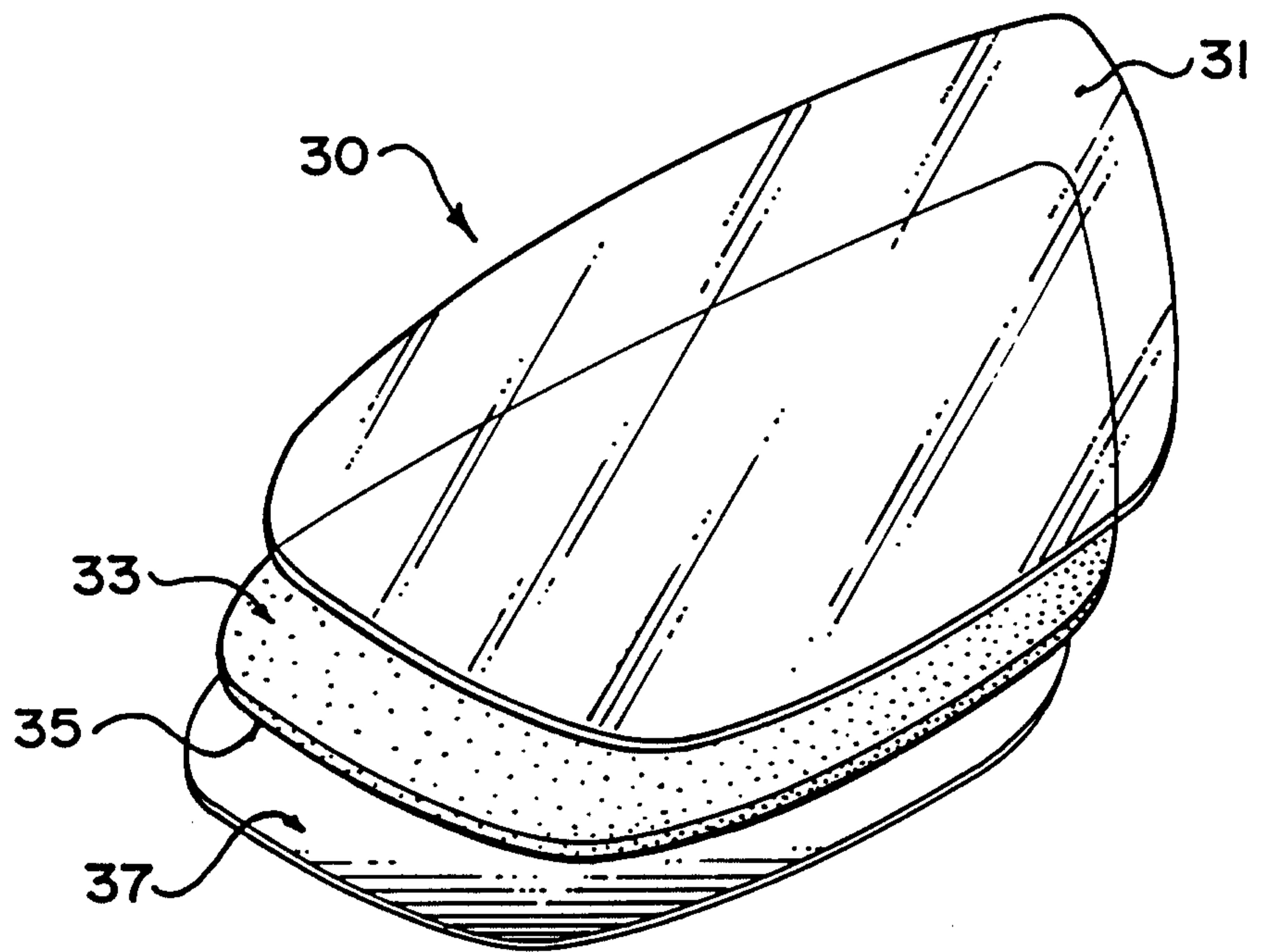
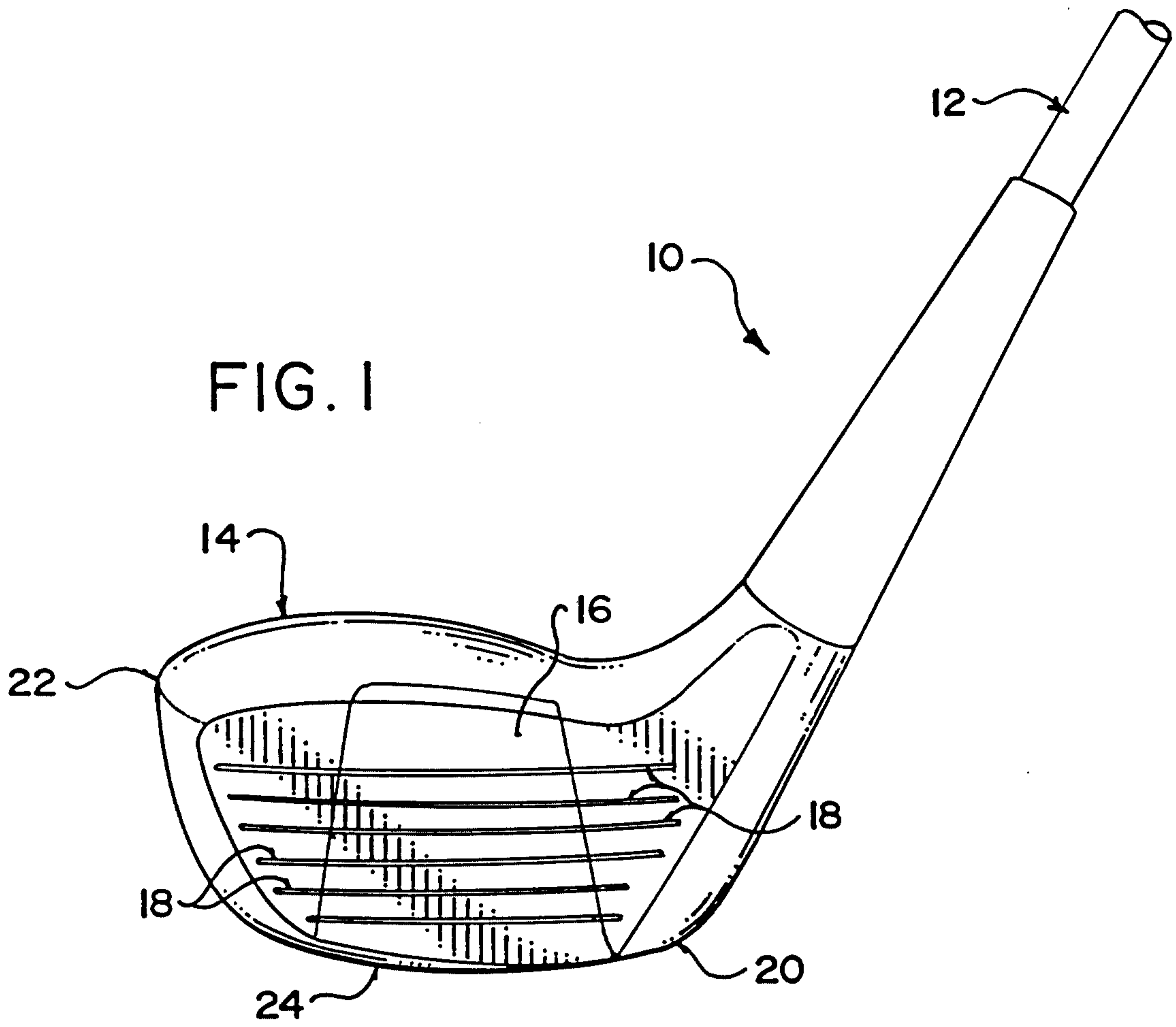


FIG. 2

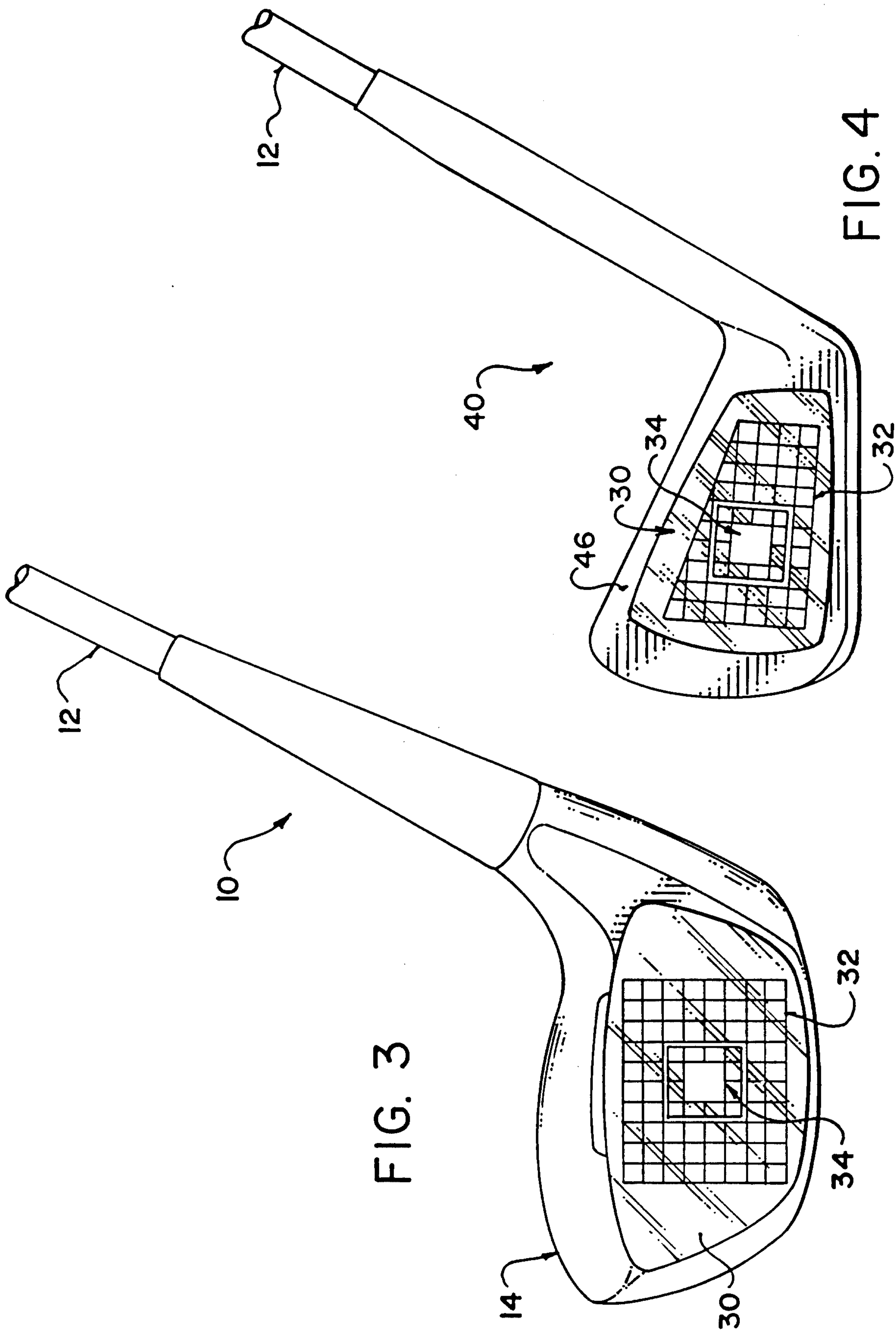


FIG. 3

FIG. 4

FIG. 5

