Jan. 21, 1969 T. H. MOREY ET AL 3,422,471

SURFBOARD WITH REMOVABLE SKEG

Filed April 3, 1967 Sheet 1 of 2

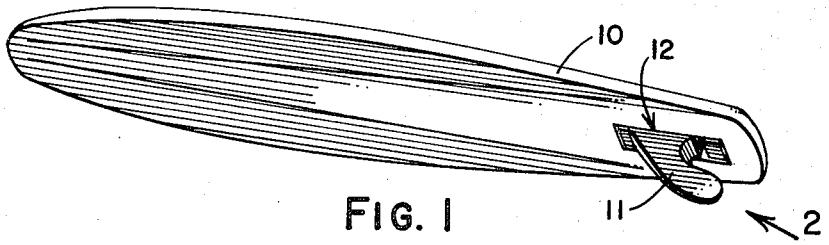


FIG. 1

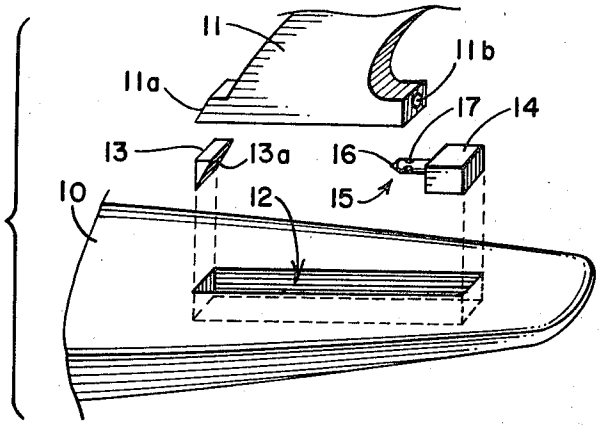


FIG. 2

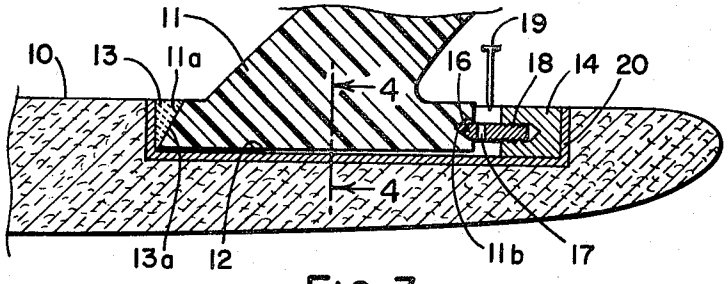


FIG. 3

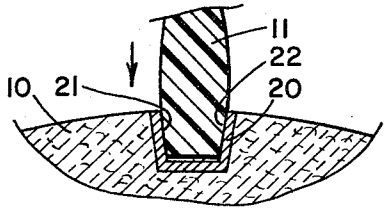


FIG. 4

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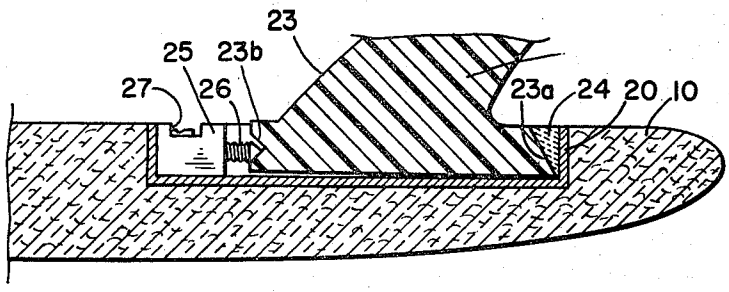


FIG. 5

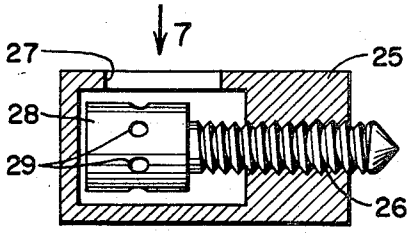


FIG. 6

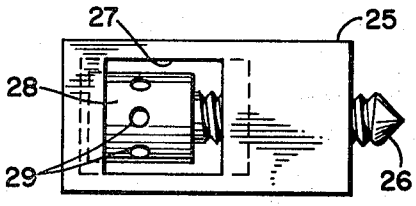


FIG. 7

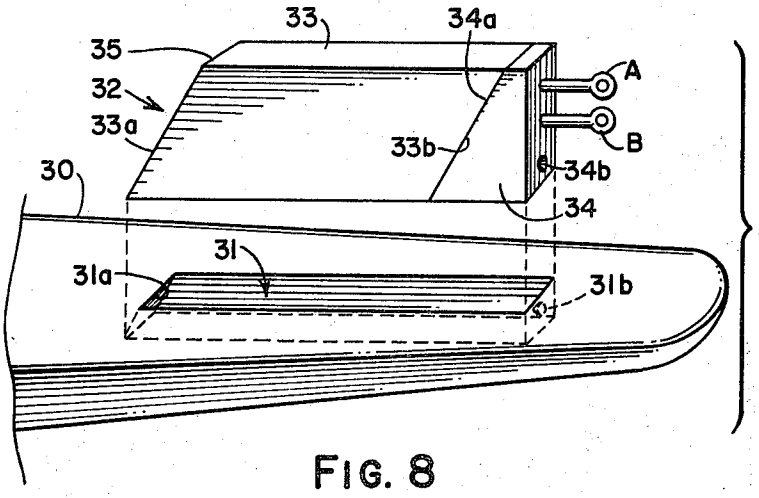


FIG. 8

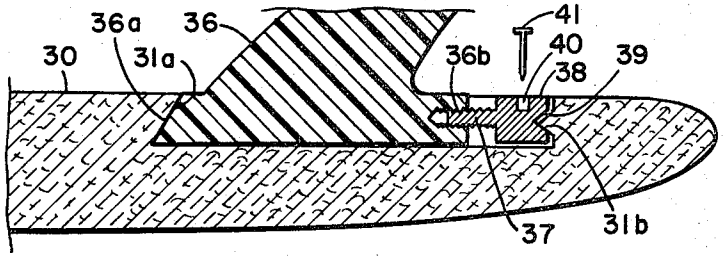


FIG. 9

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SURFBOARD WITH REMOVABLE SKEG

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ABSTRACT OF THE DISCLOSURE

This disclosure relates to a surfboard structure for enabling easy insertion and removal of a skeg such that shipping of boards is facilitated and easy replacement of a damaged skeg can be effected. The rear under surface of the board includes an elongated channel receiving the base portion of the skeg, one end of the channel being undercut to define a sloping surface and one end of the base portion of the skeg having a similarly sloping surface to wedge with the channel sloping surface. A suitable expanding means in the form of a threaded bolt and socket is provided between the other end of the channel and base portion such that after the base portion of the skeg has been received in the channel, the expanding means is actuated to urge the sloping front portion of the base portion against the undercut sloping wall of the channel thereby wedging the skeg tightly in the channel. The design also is such that a downward component of force is provided on the other end of the skeg base portion against which the expanding means acts. The side walls of the channel and side walls of the base portion are tapered to take advantage of the downward force component and thereby effect further wedging of the skeg along its sides as well as at its opposite ends.

This invention relates to surfboards with removable skegs or fins and more particularly, to an improved structural arrangement of a surfboard and skeg facilitating removal and replacement of the skeg.

Many surfboards are manufactured with a skeg or fin molded directly to the rear under surface of the board in such a manner as to essentially constitute an integral part of the board. While the skeg itself is usually manufactured as a separate part as by an injection molding operation, it is applied to the board during the wet lay-up of the Fiberglas resin laminations making up the board proper. Once the resin has set, the skeg thus becomes a permanent part of the surfboard.

An advantage in forming the skeg or fin as a permanent part of the board as described above is that the skeg will always remain in its set position in exact alignment with the board and the possibilities of any "looseness" or flutter is wholly avoided. On the other hand, boards with permanently molded skegs are difficult to ship because of the protruding nature of the skeg, are fixed in design to the particular contour of the skeg employed, and in addition, should the skeg become seriously damaged, a major portion of the board as a consequence of its Fiberglas lamination type construction is also usually damaged around the skeg area.

With the above in mind, it is a primary object of the present invention to provide an improved surfboard with a removable skeg wherein improved structure is provided enabling easy removal and insertion of the skeg and yet in which the skeg, once secured in position, is so held that all of the advantages of an integrally formed skeg are realized without the foregoing noted disadvantages thereof.

More particular objects of the invention are to provide an improved surfboard and removable skeg structure so designed that boards may be shipped separately from the

skegs with the attendant advantages of easier packaging, the skeg itself may readily be inserted at the point of sale by any of the retail outlet personnel or even by the surfer himself, and wherein it is a simple matter to replace damaged skegs or to substitute other skegs having a given contour in accord with desired performance by the surfboard.

Briefly, these and other objects and advantages of this invention are attained by providing an elongated channel on the under rear surface of the board designed to receive an elongated base portion of the skeg. One end of the channel is provided with a sloping end wall defining an undercut portion such that the channel floor is of greater length than the upper opening of the channel. One end of the base portion of the skeg similarly includes a sloping end surface to mate with the sloping wall in the channel. A longitudinally expanding means is provided between the other end of the channel and the other end of the base portion of the skeg and functions to urge the skeg forwardly and downwardly into the channel such that it is locked in place. In preferred embodiments of the invention, the channel walls themselves are tapered such that the width of the floor of the channel is slightly less than the width at the upper opening of the channel and the side walls of the skeg base portion are similarly tapered such that wedging of the skeg in the channel results in wedging pressures all along the walls of the base portion as well as at opposite ends with the result that the skeg is completely stabilized after it is once set in position.

A better understanding of the invention will be had by now referring to the accompanying drawings, in which:

FIGURE 1 is a perspective view of a surfboard incorporating a removable skeg in accord with the present invention;

FIGURE 2 is an enlarged fragmentary exploded view illustrating a first embodiment of the invention;

FIGURE 3 is a fragmentary cross section of the elements illustrated in FIGURE 2 when in assembled condition;

FIGURE 4 is a fragmentary cross section taken in the direction of the arrows **4—4** of FIGURE 3;

FIGURE 5 is a fragmentary cross section similar to FIGURE 3 but illustrating a modified embodiment of the invention;

FIGURE 6 is a cross section with certain components shown in full lines of a part of the securing structure of FIGURE 5;

FIGURE 7 is a plan view taken in the direction of the arrow 7 of FIGURE 6;

FIGURE 8 is a fragmentary exploded perspective view illustrating a molding means for forming a channel in accord with a second embodiment of the invention; and,

FIGURE 9 is a fragmentary cross section of the assembled components in accord with the second embodiment.

Referring to FIGURE 1 there is shown a surfboard **10** having a skeg **11** secured within an elongated channel **12** formed in the rear under surface of the surfboard **10**.

Referring to both FIGURES 2 and 3, the channel **12** includes a wedge shaped block **13** at one end to define a sloping end wall **13***a* such that the floor of the channel is slightly longer than the upper opening of the channel, the sloping end wall defining an undercut. The other end of the channel **12** is arranged to receive a longitudinally expanding means in the form of a socket structure **14** threadedly receiving a bolt **15**. The protruding end of the bolt terminates in a conical end **16** which faces the sloping end wall **13***a*.

The base portion of the skeg **11** as illustrated in both FIGURES 2 and 3 includes at one end a sloping surface **11***a* matching the sloping end wall **13***a*. The other end of the base portion in turn includes a conically shaped

dimple 11*b*. The bolt 15 itself includes transverse openings 17 for receiving a suitable turning means to thread the bolt into the socket as indicated at 18 in FIGURE 2. This turning means may comprise a nail 19.

To provide increased strength for the channel, the same may be completely lined with metal floor, side and end walls such as indicated at 20 in FIGURES 3 and 4. With particular reference to FIGURE 4, it will be noted that the side walls of the channel are tapered slightly as at 21 and 22 and the base portion of the skeg 11 has its side walls similarly tapered.

In the embodiment illustrated in FIGURES 1 to 4, the channel 12 is initially formed by a suitable elongated rectangular mold piece with tapered side walls during the wet lay-up of the surfboard. The mold piece is then removed leaving an elongated rectangular channel with sloping side walls. The wedge block 13 is then bonded into the front end of the channel and the socket structure 14 bonded in the rear end. The wedge block 13 and socket structure 14 thus constitute a permanent part of the surfboard.

To secure the skeg 11 to the surfboard 10, the bolt 15 is first threaded back into the socket 14 as by means of the nail 19 or any other suitable device which may be inserted in one of the openings 17. The base portion of the skeg 11 is then fitted in the channel with the sloping end surface 11*a* received under the undercut sloping end wall 13*a* at the front end of the channel. In this respect, the length of the base portion of the skeg is such that it may readily be received in the upper opening of the channel and the skeg then slid forwardly to cause the front end 11*a* to mate with the sloping end wall 13*a*.

After the skeg has been initially positioned in the channel, the bolt 15 is then unthreaded from the socket 14 such that its conical end 16 will be received in the dimple 11*b*. It will be evident from FIGURE 3 that the dimple is disposed slightly further above the floor of the channel than the axis of the bolt. As a result, the lower conical end of the bolt will engage the lower surface portion of the conical dimple and thus a downward component of force will be exerted on this portion of the skeg as well as a general urging of the skeg to the left to wedge the front end sloping surfaces into tight engagement.

Continuous unthreading of the bolt will thus exert downward forces at both ends of the base portion of the skeg and because of the tapered wall configuration described in FIGURE 4, the entire length of the base portion of the skeg will be tightly wedged in the channel.

The skeg may be easily removed at any time by simply threading the bolt 15 in the opposite direction free of the dimple and the skeg then simply slid rearwardly slightly and lifted from the channel.

FIGURE 5 illustrates a slightly modified embodiment wherein a skeg 23 is provided with a rear end sloping surface 23*a* and a front end dimple 23*b*. The channel in the surfboard 10 may be molded as described for the channel 12 and a suitable lining 20 provided. A wedge block 24 is then received and bonded in the rear end of the channel. A socket 25 and threaded bolt 26 in turn are received and bonded into the forward end of the channel.

The socket structure in the embodiment of FIGURE 5, as seen best in FIGURES 6 and 7 includes an upper window opening 27 to provide access to the bolt 26. The inner portion of the bolt includes an enlarged body portion 28 having transverse openings 29 for receiving a turning device, such as a nail, through the upper window 27.

The dimple 23*b*, as in the case of FIGURES 1 to 4, is positioned slightly higher from the floor of the channel than the axis of the bolt 26 such that when the bolt 26 is unthreaded from the socket to engage within the dimple, a downward component of force will be exerted on the front portion of the skeg. This force in cooperation with the downward component of force on the rear portion of the skeg as a consequence of the slope of the wedge block 24, thoroughly wedges the skeg within the channel.

The operation of inserting or removing the skeg in the embodiment of FIGURES 5, 6, and 7 is similar to that described in conjunction with FIGURES 1 to 4. The only difference is that the modified longitudinally expanding means in the form of the socket and bolt and the wedge block are reversed in positions and this arrangement in certain instances may be desirable because of easier accessibility to the bolt in view of the general geometry of the skeg itself. The wedge blocks and sockets are permanently bonded into the channel in the same manner as the wedge block and socket structure described in FIGURES 1 to 4.

Referring now to FIGURE 8, there is shown a second embodiment of the invention wherein a surfboard 30 includes a channel 31 having an undercut sloping end wall 31*a* at one end and a conical projection 31*b* at its other end. In this embodiment, the entire channel is formed during the wet lay-up of the surfboard.

The foregoing is achieved by means of a mold 32 comprising mold blocks 33 and 34 secured together by suitable eye bolts A and B. The mold block 33 includes a front sloping surface 33*a* and the mold block 34 includes a conical dimple or cavity 34*b*.

In forming the channel, the mold blocks are simply disposed in the under surface of the surfboard during the wet lay-up operation as described and the various Fiberglas laminations and resins molded about the base portion of the molds. After the resins have cured, the mold is removed by unthreading the eye bolts A and B and then lightly tapping the block 33 as at the point 35 with a hammer to loosen the same. The mold block 33 may then be slid upwardly and to the right along the division line 33*b* between the mold blocks. After the mold block 33 has been removed, the mold block 34 is then slid forwardly slightly to leave the conical projection 31*b* formed in the channel and then lifted from the channel.

FIGURE 9 illustrates the skeg structure in this second embodiment wherein a skeg 36 is provided with a sloping front end 36*a* to match the slope 31*a*. The rear end defines a threaded socket 36*b* for receiving a bolt 37. The bolt 37 includes an enlarged head 38 terminating in a dimple 39. The axis of the bolt 37 is positioned slightly higher above the floor of the channel than the projection 31*b*. The enlarged head 38 may be provided with transverse openings 40 for receiving a suitable turning means such as a nail 41.

In assembling the skeg 36 on the surfboard 30 of FIGURE 9, the bolt 37 is first threaded into the rear portion of the skeg and the skeg then inserted in the channel. Unthreading of the bolt 37 will then cause its enlarged head and dimple portion to engage the conical projection 31*b* and, as in the other embodiments, a downward component of force as well as a longitudinal component of force will be exerted on the skeg. The skeg will thus be thoroughly wedged within the channel.

The embodiments of the invention illustrated in FIGURES 1 to 7 are deemed preferable to the embodiment of FIGURES 8 and 9 simply because the longitudinally expanding means in the form of the socket and threaded bolt may be permanently formed in the surfboard and will not constitute a part of the skeg structure. The skeg itself may thus be integrally injection molded without the necessity of any hardware secured thereto.

From the foregoing description, it will be evident that the present invention has provided a greatly improved structure for facilitating the insertion and removal of skegs from surfboards. Not only is the skeg so secured as to be substantially equivalent to an integrally molded surfboard and skeg, but the securing means is such that a surfer himself may easily remove and replace the skeg, if damaged or may replace the skeg with a different skeg in accord with the desired performance of the surfboard. All of the various advantages of removable skegs are thus provided and the objects of this invention fully realized.

What is claimed is:

1. A surfboard having a removable skeg, comprising, in combination: means defining an elongated channel on the under rear surface of said surfboard, one end of said channel having a sloping end wall surface defining an undercut such that the floor of said channel is longer than the upper opening of said channel, said skeg having an elongated base portion receivable in the upper opening of said channel, said base portion having at one end a sloping end surface to match the slope of said one end of said channel; and longitudinally expanding means disposed between the other end of said channel and the other end of said base portion when said skeg is in place to enable urging of said skeg along said channel in a direction to cam said sloping end surface against said sloping wall surface defining said undercut whereby said skeg is wedged into tight engagement in said channel.

2. A surfboard according to claim 1, in which said longitudinally expanding means includes a threaded bolt and threaded socket means disposed in said channel, unthreading of said bolt from said threaded socket means effecting said urging of said skeg to wedge the same and simultaneously effecting a downward component of force on said other end of said base portion.

3. A surfboard according to claim 2, in which the side walls of said channel are tapered such that the width of said channel at its floor is less than the width at its upper opening, said base portion having matching tapered side walls such that said skeg is wedged in said channel along its side walls in addition to each end.

4. A surfboard according to claim 3, in which said one end of said channel having a sloping end wall surface defining an undercut is defined by a wedge shaped block bonded into the underside of said surfboard, said threaded socket means being bonded into said other end of said channel, and said other end of said base portion having a conical dimple positioned from its bottom end a distance slightly greater than the axis of said bolt, the end of said bolt protruding from said socket being conical such that unthreading of said bolt urges its conical end into said dimple to thereby effect said downward component of force on said skeg.

5. A surfboard according to claim 3, in which said threaded socket means is formed in said other end of said skeg, the end of said bolt protruding from said socket terminating in an enlarged head having a conical dimple in its end, said other end of said channel including a concal projection spaced a distance from the floor of said channel slightly less than the axis of said bolt, such that unthreading of said bolt urges said conical dimple over said conical projection to thereby effect said downward component of force on said skeg.

6. A surfboard according to claim 3, in which said bolt includes transverse openings exposed at the upper opening of said channel for receiving turning means to enable threading and unthreading of said bolt.

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