**AUSTRALIA**

*Patents Act 1990*

**PATENT REQUEST: PETTY PATENT**

We, being the person(s) identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying Petty complete specification.

Full application details follow.

<table>
<thead>
<tr>
<th>[71] Applicant</th>
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| [64] Invention Title  | AN "X" SHAPED FIN FOR SURFBOARDS AND OTHER WATERCRAFT |

| [72] Name(s) of actual inventor(s) | STEPHEN JOHN PETERSON and ALEXANDER STUART PETERSON |

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**BASIC CONVENTION APPLICATION(S) DETAILS**

|-------------------------|--------------|--------------|--------------------------|

**DIVISIONAL APPLICATION DETAILS**

<table>
<thead>
<tr>
<th>[62] Original application number</th>
<th>01/05/91</th>
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</table>

Person by whom made

*Delete as appropriate*
NOTICE OF ENTITLEMENT

(To be filed before acceptance)

I, STEPHEN JOHN PETERSON and ALEXANDER STUART PETERSON of 12 HELEN ST, WARILLA, NSW, 2528

being the applicant in respect of Application No. 76333/91, state the following:-

(a) If the nominated person is not the inventor - provide details of the nominated person's entitlement to the grant of a patent.

(b) If the applicant claims priority from another application:

(i) being a PCT applicant who claims priority from a basic application - a copy of the relevant basic documents, which, if not in English, must be accompanied by a translation of the documents into English and related certificates of verification; and

(ii) in any other case - a statement by the applicant setting out the entitlement to claim that priority.

(c) If Section 6 of the Act (Micro-organisms) is applicable - provide details setting out the entitlement of the nominated person to rely on the deposit.

(d) If the Application is for a patent of addition and the nominated person is not the nominated person/patentee of the main invention - provide a signed statement of consent.

(e) If the Application claims convention priority - state whether or not the convention application was the first made in a convention country. If not the first, indicate whether Section 96 (1) has been invoked.

THE PERSON(S) NOMINATED FOR THE GRANT OF THE PATENT IS/ARE THE ACTUAL INVENTORS.

Stephen Peterson
(Signature)

Alexander Peterson
(Signature)

28/5/91
(Date)
AN "X" SHAPED FIN FOR SURFBOARDS AND OTHER WATERCRAFT

Application No.: 76333/91
Application Date: 01.05.91
Publication Date: 06.02.92
Publication Date of Granted Application: 06.02.92

Applicant(s)
STEPHEN JOHN PETERSON; ALEXANDER STUART PETERSON

Inventor(s)
STEPHEN JOHN PETERSON; ALEXANDER STUART PETERSON

Prior Art Documents
AU 38864/85 A63C 15/05 B63B 3/38
AU 34481/84 A63C 15/05 A63C 15/00 B63B 3/38

Claim
1. An X-fin device for use on surfboards and other water craft to improve manoeuverability, stability, and strength of attachment, comprising the cross-sectional shape of the letter "X", derived by the marrying of two single "shark" shaped fins, which are of airfoil shape being curved (foiled) on their upper surfaces, made of fibreglass or any other suitable substance to form one fused X-shaped fin, which is then attached by the two too basal arms to the rear undersurface of a surfboard or water craft. The two too basal arms are actually the top arms of the X-shaped fin.
COMPLETE SPECIFICATION
FOR A PETTY PATENT
ORIGI NAL

NOTICE

1. The specification should describe the invention in full and the best method of performing it known to the applicant.

2. The specification should be typed on as many sheets of good quality A4 International size paper as are necessary and inserted inside this form.

3. The claims defining the invention must start on a new page. If there is insufficient space on this form for the claims, use separate sheets of paper. The words "The claims defining the invention are as follows" should appear before claim 1. After the claims the date and the name of the applicant should appear in block letters.

4. This form must be accompanied by (a) a true and exact copy of the description, claims and drawings (if any) and (b) an additional copy of the claims.

(see Pamphlets explaining formal requirements of specifications and drawings)

TO BE COMPLETED BY APPLICANT

Name of Applicant: STEPHEN JOHN PETERSON and ALEXANDER STUART PETERSON

Actual Inventor(s): STEPHEN JOHN PETERSON and ALEXANDER STUART PETERSON

Address for Service: 12 HELEN ST, WARILLA, NSW 2528

Invention Title: AN "X" SHAPED FIN FOR SURFBOARDS AND OTHER WATERCRAFT

Details of Associated Provisional Applications: Nos: .................................................................

The following statement is a full description of this invention, including the best method of performing it known to me:-
This invention relates to a new type of stabilisation fin for use primarily on surfboards but also on other forms of water craft such as wind surfers, surf skis, belly boards, yachts, boats, and ships.

Ever since the invention of surfboards enabling humans to ride ocean waves as they break near beaches, some form of fin at the rear underside part of the board has been an essential part of the board to stabilise its direction onto, down, across, or up the wave. Other intricate manoeuvres required by professional board-riders have spurred on the search for the ideal arrangement of fin or fins for the "ideal" board.

There has been a progression from one fin, to two fins, to the present most popular number of three fins, at the tail of each board. Of note is the Ben Lexcen-Shane Horan fin which is "Y" shaped, compared with all other fins which are a totally vertical "I" shape.

Problems of today's one, two, or three fin boards are:

1. They tend to travel in a straight line, and this means they present resistance to turning, thus creating difficulty in manoeuvrability.
2. They tend to slide sideways down off the face of big waves, when the rider is trying to proceed across the face of the wave at some distance up its face.

3. On choppy water conventional vertical fins give a bumpy ride, making the board hard to control.

4. On weak waves the fins of conventional boards play no part in the forward motion of a surfboard which is being rhythmically bounced by the rider to stay on the wave.

5. The Lexcen-Horan "Y" shaped fin (Patent Application No. 38864/85) attempts to eliminate the above faults in vertical-only "I" shaped fins. Lexcen-Horan fins were tried further towards the nose of a board, away from the tail, in the area of the board's centre of gravity. This was to eliminate leverage on the fin, and thus avoid the event of the fin ripping off the board, which occurs rather regularly on vertical fins of all kinds. Whilst producing a very manoeuvrable board, the Lexcen-Horan "Y" shaped yacht-type fin remains little used.

These problems of the 'prior art' are overcome by the present invention, which provides a surfboard (or watercraft) tail fin device comprising the following essential features:

1. An X-shaped construction combining two normal single
"shark fin" shaped fins into one inseparable crossed-fin.

2. The X-fin is made by slotting and joining two single fins, or by injection moulding the X-fin as a solid single structure of fibreglass, Lexan, or similar substance.

3. The X-fin now looks like the letter "X" when viewed front on, or like a shark fin when viewed side on. The X shape creates four arms, two basal arms attached to the board, and two wing arms below them.

4. The X-fin becomes a permanent part of the surfboard or water craft when joined to it by a suitable bonding or locking device. The X-fin is joined to the rear underside of a surfboard, straddling the board's centre line.

5. Where the two basal arms join the surfboard a triangular hollow tunnel is created through which water passes. This triangular tunnel creates great structural strength and stability within the X-fin itself, and in the joining of the X-fin to the board. The X-fin resists being pulled over or knocked over to break it from the board because it is a triangle, and not a single vertical structure.

6. The X-fin creates four right angles between its four arms. One of these right angles forms a triangular tunnel at the top of the X-fin when it is joined to the board. The two right angles (one on either side
of the X-fin) form two right angular troughs along each side of the X-fin which resist sideways pressure and movement, thus making for stability, and preventing the board (especially its tail end where the rider stands) from sliding off the face of a wave when travelling across it.

7. Because of the great strength of the X-fin, it can be placed near the tail of the board, as it will not be damaged by the added leverage this causes.

8. The X-fin, because of its crossed-fin nature and the non-vertical arrangements of all its parts, results in there being a high fin-surface-area located in the depth and volume of water occupied by the fin. Very deep fins cause excessive resistance to steering, but the X-fin is economical on the use of depth.

9. For similar reasons the X-fin, with its large surface area confined in a small space, operates beneath a small "rear-control area" of the surfboard. Most control of the board is exercised by the rider's rear foot. With the old single-fin board the rider can use his rear-control foot directly over the fin. But with the spaced-apart two fins, and the widely spaced three fins so popular today, the rider cannot place his rear foot exactly on the area of fin control. The X-fin overcomes this and provides maximum fin area under
minimum rear-control area of the board. There is no need for change in the plane-shape (outline) of the board.

The best preferred method known at present is:

1. The X-fin is constructed in fibreglass or similar plastic,
2. Each of the two fins forming the X is identical and shaped like a shark fin, except that the upper surface of each is an airfoil whereas its lower surface is plane and not convex like the upper surface. The two fins are in fact mirror images of each other.
3. The two fins are "married" to each other precisely at right angles, giving a final X-fin composed of four right angles, having two wing arms and two basal arms,
4. The four winged X-fin is attached near the rear under surface of a surfboard's central keel line by the two basal arms of the X-fin configuration.
5. The two basal arms of the X-fin and the under surface of the surfboard form a tube of triangular cross section which gives great structural strength to the X-fin and its board attachment.

In other forms of the invention many variations are
possible, using:

1. Varying shapes and sizes of the original two fins which are joined together to form the final X-fin.
2. Varying positions of slot cuts on the original two fins, so that the final X-fin has two basal arms and two wing arms whose proportions of wing arm length to basal arm length may be different.
3. Varying angles at which the two basic fins are married. They need not always produce four 90° angles, but 100°, 100°, 80°, 80°, or any other desired combination which suits.
4. Varying angles of attachment of the X-fin to the board, so that the X-fin can sweep back towards the tip of the board tail at different angular distances from the board.

In the drawings:

FIG. 1 shows one example of an X-fin device according to this invention as it is attached to a surfboard, from a side-on view.

FIG. 2 shows the X-fin device attached to a surfboard, viewed from the rear end of the board looking towards the front end.
FIG. 3 shows a side-on view of an ordinary "shark" fin shaped surfboard fin before it is married to a second identical fin to become an X-fin device according to this invention.

FIG. 4 shows a front-on view of an ordinary "shark" fin shaped surfboard fin before it is married to a second identical fin to become an X-fin device according to this invention.

FIG. 5 shows a schematic representation of how two ordinary "shark" fins become an X-fin device according to this invention.

FIG. 6 shows a plan drawing from underneath a surfboard tail with the X-fin device attached to the board.

Referring to FIG. 1 it can be seen that the X-fin device according to this invention comprises an X-shaped surfboard fin (2) attached to the normal rear underside surface of a surfboard (1) where it acts as a stabilising fin, and is seen from a side-on view.

FIG. 2 shows the X-fin device (4), (5), (6), (7), when viewed from an end-on view of the surfboard (3). One "shark" fin (7), (5) has been permanently fused to another "shark" fin (4), (6) to produce the X-fin device.
(4), (5), (6), (7) according to this invention. It consists of four arms which make up the "X" shaped cross section. The two basal arms (4), (7) are joined to the surfboard, and the two wing arms (5), (6) dig into the water below. The four arms enclose four right angles (4) (7), (4) (5), (5) (6), (6) (7) which slice through the water. Right angle (4) (7) is in fact a tunnel formed by the X-fin and the base of the board. The two lateral right angles (4) (5) and (6) (7) provide resistance to sideways movement by the board. The bottom right angle (5) (6) formed by the two wing arms provides resistance against unnecessary up or down movement by the board.

FIG. 3 shows an example of a single "shark" fin (8) from a side view. Two of these fins are slotted together and fused to produce the X-fin device according to this invention. (10) becomes a basal arm, (11) becomes a wing arm, and (9) shows the approximate location of the marrying line where the two "shark" fins are joined to form the X-fin device.

FIG. 4 shows an example of a single "shark" fin (12) from a front view. Two of these fins are slotted together to form the X-fin device. The area of attachment to the surfboard (13) is at the top of the fin. The basal arm (14) and the wing arm (15) result in...
from the top and bottom of the single fin after joining.

FIG. 5 shows two single "shark" fins (16) from a front view, and how when joined together at right angles they produce the characteristic X-fin (17) device according to this invention, with its surfboard attachment areas (18), its basal arms (19), and its wing arms (20).

FIG. 6 shows a plan view of the X-fin (21) on the underside, rear end of the surfboard (22). The X configuration (23) slopes back in streamlined fashion, and the two wing arms (24) together form a heart-shaped outline.
The claims defining the invention are as follows:

1. An X-fin device for use on surfboards and other watercraft to improve manoeuvrability, stability, and strength of attachment, comprising the cross-sectional shape of the letter "X", derived by the marrying of two single "shark" shaped fins, which are of airfoil shape being curved (foiled) on their upper surfaces, made of fibreglass or any other suitable substance to form one fused X-shaped fin, which is then attached by the two top basal arms to the rear undersurface of a surfboard or watercraft. The two top basal arms are actually the top arms of the X-shaped fin.

2. The X-fin device of claim 1 wherein no components are vertical and the four arms of the X-fin form four angles which add up to 360°. The top angle faces the undersurface of the board; the two side angles confront the water and prevent sideways movement; the bottom angle confronts the water and prevents up-and-down movement; thus the water is confronted by three right angled (approximately) surfaces, and not by mere plain surfaces as in other surfboard fins, so that excessive sideways or up-and-down movement of the board is prevented, and the two bottom wing arms which are airfoiled on their upper surfaces give lift to the board.
increasing its speed; wherein the two top basal arms of the X-fin join the rear underside of the surfboard or water craft along two parallel lines to form a tunnel of triangular cross-section giving great strength to the X-fin, and its attachment to the surfboard, unlike all other surfboard fins which join the board along one line only and have no cross-structural support within the fin or its attachment to the board.

10 3. An X-fin device substantially as herein described with reference to the accompanying drawings.

Dated this 11th day of November
19 91

[Signature]

[Signature]