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(71) Applicant: **Wells, Raymond**
18010 Diano Castello (Imperia) (IT)

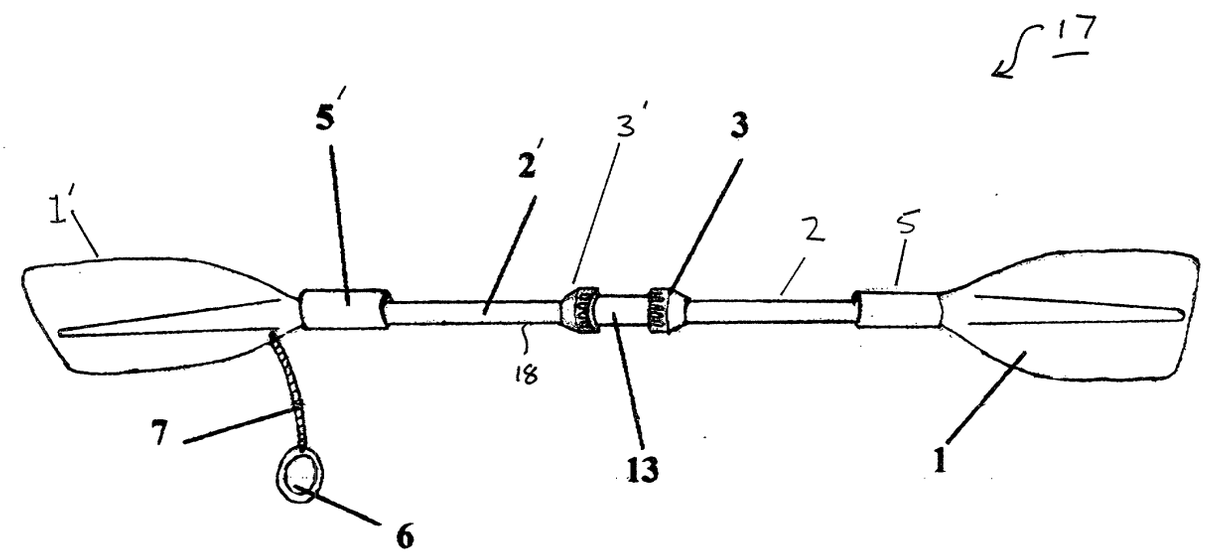
(72) Inventor: **Wells, Raymond**
18010 Diano Castello (Imperia) (IT)

(74) Representative: **Suckling, Andrew Michael et al**
Marks & Clerk,
4220 Nash Court,
Oxford Business Park South
Oxford OX4 2RU (GB)

(54) A paddle

(57) A paddle (17,21) comprises a shaft, a first blade (1) mounted on a first end of the shaft, and a second blade (1') mounted on a second end of the shaft. The first blade (1) is able to rotate, in use, about the axis of the shaft relative to the second blade (1'). The paddle has limit means (9,14) for limiting the relative rotation of the two blades, relative one another, to a maximum of approximately 180°.

[Fig 1]



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Description

[0001] The present invention relates to a paddle, in particular to a paddle which may be used as an exercise paddle. The paddle may alternatively be used by a swimmer either as a buoyant support or as a means for propelling the swimmer through the water.

[0002] Many forms of keep-fit exercises and keep-fit exercise apparatus are known. Land-based exercise and keep-fit apparatus have the disadvantage, however, that they place pressure and strain on the unsupported body. It is therefore preferable for keep-fit exercises to be carried out in water, since the buoyancy of the water helps support the person's body. A further advantage is that the water cools the user's body and so reduces the likelihood of the user becoming too hot. The present invention relates to a swimming paddle that may be used as an exercise aid so that a user may exercise while in a swimming pool or other body of water, so that their body is kept cool and their muscles are supported by the water. A further advantage of the invention is that it allows a user to exercise the muscles of their upper body, whereas the majority of keep fit exercises exercise muscles in the lower part of the body (with weight lifting being the principal exception to this).

[0003] The paddle of the invention may also be used as a swimming aid, for example to enable a weak swimmer to gain confidence, or may be used to enable a swimmer to propel themselves through the water more easily.

[0004] A first aspect of the present invention provides a paddle comprising: a shaft, a first blade mounted on a first end of the shaft; and a second blade mounted on a second end of the shaft; wherein the first blade is able to rotate about the axis of the shaft relative to the second blade; and further comprising limit means for limiting rotation of the first blade relative to the second blade to approximately 180° or less.

[0005] Mounting the blades on the shaft such that one blade can rotate, about the axis of the shaft, relative to the other blade means that a user can alter the orientation of the blades to suit the point in the stroke cycle.

[0006] Consider a swimmer who is preparing to make a "right" stroke - in which the user pulls the right hand blade (as seen by the user) of the paddle towards them. The swimmer stretches their right hand as far forward as possible when starting the right stroke, to gain the maximum length of stroke. As the swimmer's right hand comes over the top of the swimmer's head (Fig 7(a), A), their right hand twists the right blade of the paddle clockwise by approximately 90° until the right blade is substantially horizontal (and thus is parallel to the surface of the water). This orientation of the right blade provides maximum resistance on entry to the water and it also sets the vertical stop for the left blade. As the swimmer's right hand pulls the right blade through the water it will slowly turn the blade anticlockwise to keep the face of the right blade generally perpendicular to the pull (Fig. 7(b), C).

[0007] As the right hand blade enters the water the left blade is coming to the end of its stroke (Fig 7(a), B). During the left stroke the swimmer's left hand has been twisting the left blade so as to keep it substantially perpendicular to the pull, until the left blade comes against the stop, at which point the left blade is substantially vertical. The left blade thus creates minimum drag as it comes up and out of the water. As the left blade passes forwards over the swimmer's head the left hand turns the left blade clockwise until it is parallel to the water, ready for the next left stroke.

[0008] The twisting of the blades is a natural body movement. As the swimmer's right hand twists the right blade clockwise ready for the start of a right stroke the left hand twists the left blade anticlockwise so that it is in the correct orientation to come out of the water with minimum drag. As the right hand pulls back the right blade through the right stroke it naturally twists the right blade anticlockwise, as the left hand passes forwards over the swimmer's head it naturally turns the paddle clockwise ready for the start of the next left stroke, etc.

[0009] A swimming paddle of this general type is disclosed in US patent No. 3 052 897. In this prior art paddle, however, one blade may rotate relative to the other blade, around the axis of the shaft, without limit. It is therefore very difficult for a user to know whether the blades of the paddle are in the correct orientation relative to one another for the stroke that the user is about to make. A swimming paddle of the present invention, in contrast, is provided with means for limiting the relative rotation of the blades of the paddle to a maximum of approximately 180° or less. A swimming paddle of the invention is therefore convenient to use, since a user simply has to rotate the blades away from one another to the maximum extent possible - and the user then knows that the two blades are at approximately 180° to one another.

[0010] A second aspect of the invention provides: a hand grip for a shaft, wherein the hand grip has an internal cross-section greater in a first direction than in a second direction, the second direction being perpendicular to the first direction; wherein the dimension of the internal cross-section along the second direction is chosen so that the hand grip grips, in use, the shaft; and wherein application of a compressive force along the first direction causes a reduction of the grip of the hand grip on the shaft.

[0011] Other aspects and preferred features of the present invention are set out in the dependent claims.

[0012] Preferred embodiments of the present invention will now be described by way of illustrative example with reference to the accompanying figures in which:

Figure 1 is a schematic illustration of a paddle according to an embodiment of the present invention;

Figure 2 is a schematic view of a paddle according

to a second embodiment of the present invention;

Figure 3(a) is a schematic side view of a coupling of a paddle of the present invention;

Figure 3(b) is a view of one end of the coupling of Figure 3(a);

Figure 3(c) is a view of the other end of the coupling of Figure 3(a);

Figure 3(d) is a sectional view of the coupling showing an orienting mechanism;

Figure 3(e) shows a tapered locking nut;

Figure 3(f) is a schematic view of the flotation ball of the paddle of Figure 2;

Figure 4 is a schematic perspective illustration of a first portion of a paddle of the present invention;

Figure 5 is a schematic illustration of second portion of the paddle of the present invention;

Figure 6(a) is a perspective illustration of a hand grip of the present invention;

Figures 6(b) and 6(c) are sectional views of the handgrip of Figure 6(a) in its locked and unlocked positions respectively;

Figure 6(d) is a sectional view of a further hand grip of the present invention;

Figures 7(a) and 7(b) show the paddle of Figure 1 in use; and

Figures 8(a) and 8(b) show the paddle of Figure 2 in use.

[0013] Like components are referred to by like reference numerals throughout the description.

[0014] Figure 1 is a schematic view of a paddle according to the present invention. The paddle denoted generally by 17 comprises a shaft 18, a first blade 1 attached to one end of the shaft 18 and a second blade 1' attached to the other end of the shaft 18. A user is able to rotate the first blade 1, relative to the second blade 1', about the axis of the shaft 18. The paddle is further provided with limit means for limiting the relative rotation of the blades to a maximum of approximately 180°, and these limit means will be described below.

[0015] Provision of the limit means has the advantage that a user is required to concentrate only on the forward blade, which the user can see at the start of the downward stroke. By keeping the blade in front of the user, which is entering the water for the downward pull stroke, parallel to the water, not only does the user gain the most forward thrust but it also sets the vertical stop position for the paddle in the return upward stroke. As a result, all the user has to do is twist the wrist to turn the blade on the upward stroke to a position of 90 degrees to the blade on the downward stroke. The blade automatically comes against a stop, so stopping the paddle in the vertical position causing minimum drag on the upward stroke until the paddle clears the water. When this blade has finished its upwards stroke it is twisted, as the user's arm goes up and over, ready for its next downward stroke.

[0016] The paddle is further provided with a first hand grip 5 provided adjacent the first blade and a second hand grip 5' provided adjacent the second blade 1'. Provision of the hand grip 5,5' makes the paddle more comfortable to use, since a user is not required to grip the shaft 18 directly.

[0017] It is preferable that a user can adjust the position of the hand grips 5, 5' on the shaft 18, to suit the natural position of the user's hands on the shaft 18. Moreover, when the paddle is in use as an exercise paddle, adjusting the position of the user's hands along the shaft 18 can vary the effort required from the user, and this is a further reason why it is preferable that the position of the hand grips can be moved along the shaft. In a preferred embodiment, therefore, the handgrip is made of a resilient material and has an internal cross section which is significantly smaller in one direction than in the perpendicular direction. For example, the hand grips may have an internal cross-section that is oval or egg-shaped.

[0018] The hand grip is placed on the shaft such that the shaft passes through the hand grip at a point where its internal cross-section is smaller than the external diameter of the shaft, as shown in Figure 6(b). The hand grip naturally grips the shaft 18, and so is held in position on the shaft 18. In order to move a hand grip it can be compressed along its longer dimension, for example by using a vice or other suitable tool, as shown in Figure 6 (c). Compressing the handgrip in this way causes the grip of the hand grip on the shaft to be loosened. The hand grip may then be repositioned, after which the compressive force F can be removed so as to secure the hand grip in the new position on the shaft.

[0019] The hand grips 5, 5' preferably have an asymmetric external cross section. This enables a user to judge the orientation of each blade from the orientation of the neighbouring hand grip. In a particularly preferred embodiment the hand grips 5, 5' have an external cross section that is substantially oval or egg-shaped. The long external dimension of the grip is set in a pre-determined relation to the blade, for example parallel to the blade. As explained above, this enables a user to judge the orientation of a blade from the orientation of the respective hand grip. Furthermore, the use of an oval external cross section enables one hand grip to fit many sizes of hands. If the user has large hands, the larger

side of the grip can be fitted into the palm of the user's hand, with the user's fingers wrapped around the small diameter side of the grip. If the user has small hands, however, the small diameter portion of the hand grip may fit into the path of the user's hands, with their fingers wrapped around the larger diameter part of the grip.

[0020] In order to prevent unwanted rotation of the hand grip 5,5' on the shaft 2,2' occurring even when a very high torque is applied to the hand grip, the hand grip is preferably provided with locking means for fixing its angular position on the shaft 2,2'. The locking means may comprise a protrusion 26 that projects from the inside surface of the handgrip and engages in a complementary recess 27 in the surface of the shaft, as shown in Figure 6(b). (The spacing between the protrusion 26 and the recess 27 is exaggerated in Figure 6(b), for clarity.) The protrusion may have the form of a laterally-extending rib and the recess may be a complementary groove, although any suitable arrangement of protrusions can be used. Although Figure 6(b) shows the protrusion 26 on the hand grip and the recess 27 on the shaft it would alternatively be possible to provide one or more protrusions on the shaft and provide one or more complementary recesses on the internal surface of the hand grip.

[0021] A hand grip of the invention may be made from any suitable resilient material. The internal dimensions of a hand grip intended for use on a particular shaft are chosen so that it grips the shaft strongly in its natural state but may be released from the shaft by applying a compressive force F as shown in Figure 6(c) A hand grip of the invention may conveniently be moulded in a resilient plastics material.

[0022] A handgrip as described above is not limited to use with a paddle of the invention, but may be used in any application where it is desired to fit a shaft with a handgrip. In other applications where the hand grip of the invention is being fitted at the end of a shaft it may be desired to provide an end cap 28 that can be attached to the free end of the hand grip, for example as a "clip-fit" or a "snap-fit". The end cap 28 will prevent a user's hand from slipping off the hand grip. Figure 6(d) schematically shows a suitable end cap for a handgrip of the invention, and this end cap 28 comprises an end face 28a and a annular body 28b. The body is provided with one or more protrusions 29 that are a "clip-fit" into complementary recess(es) 30 provided on the interior surface of the handgrip. The protrusion 29 may be annular and extend around the entire circumference of the external surface of the body 28b, and the recess 30 may be an complementary annular groove. The end face 28a has a cross-section that is greater than the cross-section of the hand grip 5, so as to prevent a user's hand from slipping off the hand grip. The end face 28a may have a cross-section that is an enlargement of the cross-section of the hand grip 5.

[0023] The paddle 17 is preferably further provided with means for attaching the paddle to a user, to prevent inadvertent loss of the paddle. In the embodiment shown in Figure 1, these means consist of a stretchable wrist band 6, which can be stretched to fit around the user's wrist, connected to the paddle by a flexible lead 7.

[0024] One preferred construction of the swimming paddle, that provides for relative rotation of one blade 1 relative to the other blade 1', will now be described. In this preferred embodiment, the shaft 18 is formed of first and second shaft portions 2, 2'. The first shaft portion 2 is attached to the first blade 1, such that the orientation of the blade, relative to the shaft portion, is fixed. Similarly, the second shaft portion 2' is attached to the second blade 1' such that the relative orientation of the blade 1' relative to the shaft portion 2' is again fixed. The first and second shaft portions are connected together by a coupling 13. The coupling couples the first and second shaft portions 2, 2' together such that they are aligned substantially along a common axis, and such that the first shaft portion 2 can rotate, around the common axis, relative to the second shaft portion 2'. Each shaft portion is secured to the coupling 13 by means of a tapered locking nut 3, 3' which acts as retaining means 3,3' to secure the shaft portions to the coupling 13.

[0025] The coupling 13 is shown in more detail in Figure 3(a). As shown in Figure 3(a), the coupling consists of a body 19, which is provided at one end with a plurality of split tapered flange segments 12. One of the shaft portions, for example the left shaft portion 2' is inserted through the flange segments 12 into the coupling body 19. The tapered flange locking nut 3' on the left shaft portion is then screwed onto the screw thread 20' provided on the coupling body adjacent to the tapered flange segments 12. The locking nut 3' has a internal cross-section and, as the nut is screwed onto the screw thread 20', the effect of this tapered internal cross-section is to force the flange segments 12 inwards so that they grip on the left shaft portion 2' and thereby couple the coupling body 19 to the left shaft portion 2'. Provided that the left locking nut 3' is tightened sufficiently, the left shaft portion 2' will not be able to rotate relative to the coupling body.

[0026] The flange segments 12 are preferably tapered, and decrease in width away from the coupling body 19. This ensures that adjacent segments do not hit one another when they are forced inwards as the locking nut 3' is screwed on to the threaded portion 20'. Figure 3(a) shows the flange segments 12 in the position they adopt when forced inwards by the locking nut 3', but the locking nut 3' is omitted from Figure 3(a) for clarity.

[0027] The right shaft portion 2 is provided with a tapered flange 9. The tapered flange 9 may be, for example, a casting that is fitted onto the shaft portion 2 and secured into position by suitable means, for example by welding or by use of adhesive. Alternatively the tapered flange 9 may be integral with the shaft portion 2, for example being formed by machining the shaft portion from a thick-walled tube.

[0028] When the right shaft portion 2 is inserted into the coupling body 19, the perpendicular end face 9a of the tapered flange will abut against the right end face 19a of the coupling body. The tapered flange locking nut 3 provided on the right shaft portion may then be fastened onto the screw thread portion 20 provided adjacent to the end face 19a of the coupling body 19. The locking nut 3 has an internal cross-section with a taper that is complementary to the taper of the tapered flange 9, as shown in broken lines in Figure 3(e). The internal taper of the locking nut 3 and the external taper of the flange 9 cooperate to provide a rotateable mounting of the shaft portion 2 onto the coupling body. The shaft portion 2 cannot be withdrawn from the coupling body, because the flange 9 cannot pass through the locking nut 3, but the shaft portion 2 is able to rotate relative to the coupling body 19. Thus, the right shaft portion 2 is able to rotate relative to the left shaft portion 2', about their common axis. In consequence, the left and right blades 1, 1' can rotate relative to one another, about the common axis of the two shaft portions 2, 2'.

[0029] As noted above paddle of the present invention is provided with a limit means to limit the relative rotation of the two blades to a maximum value of approximately 180°. In the embodiment of Figures 3-5, the limit means is provided by a stop 8 that is mounted on the right shaft portion 2 inwards of the perpendicular end face 9a of the tapered locking flange 9. The stop 8 may be integral with the tapered locking flange 9 and/or with the shaft portion 2, or it may be a separate component that is secured to the tapered locking flange 9 and/or the shaft portion 2. The end face 19a of the coupling body is provided with a complementary recess 14 as shown in Figure 3(b), and the stop 8 is received in the recess 14 when the right shaft portion 2 is mounted on the coupling body 19. The relative rotation between the coupling body 19 and the right shaft portion 2 is limited by the angular extent of the recess 14; once the stop 8 engages either end 14a, 14b of the recess 14 further relative rotation in that sense is prevented. The angular extent of the recess 14 can be chosen to limit the relative rotation to any desired value, in this to approximately 180°. (It should be noted that the angular extent of the recess must be slightly greater than the desired maximum permitted angle of relative rotation, to compensate for the non-zero thickness of the stop 8.)

[0030] In a preferred embodiment the paddle is further provided with orienting means that allows a user to orient the fixed shaft of the paddle such that the two blades are parallel to one another when the rotatable blade is at approximately the mid-point of its rotation. This ensures that the rotatable blade can rotate from an orientation in which it is at approximately + 90° to the fixed blade to an orientation in which it is at approximately - 90° to the fixed blade.

[0031] The orienting means of the embodiment of Figure 1 is shown in Figures 3(d) and 4.

In this embodiment, the orienting means is provided by a locking key 4 that protrudes from the end of the shaft portion that is to be fixed relative to the connector 13, in this embodiment the left shaft portion 2'. A complementary locking recess 16 is provided within the coupling portion 19 - the bore of the coupling portion is not continuous, but is blocked by a plug 30 and the locking recess is provided on the plug 30. In use, the left shaft portion 2' is inserted into the coupling portion 19 such that the locking key 4 engages in the locking recess 16. This is shown schematically in Figure 3(d). (The separation between the locking key 4 and the locking recess 16 has been exaggerated in Figure 3(d), for clarity of illustration.) The orientation of the left shaft portion relative to the locking recess 16 is thus pre-determined, and hence the orientation of the left shaft portion 2' relative to the coupling body is also pre-determined.

[0032] The end points of the rotation of the rotatable shaft portion (in this embodiment the right shaft portion 2) are determined by the end faces 14a,14b of the recess 14 in the end face 19a of the coupling body. Providing the locking recess 16 at an appropriate orientation to the ends of the recess 14 enables the orientation of the fixed shaft, relative to the end points of the rotation of the rotatable shaft portion, to be pre-determined. In general, as noted above, it will be desirable for the two blades to be parallel to one another when the rotatable blade is at approximately the mid-point of its rotation, so that the rotatable blade to be able to rotate from an orientation in which it is at approximately + 90° to the fixed blade to an orientation in which it is at approximately - 90° to the fixed blade. The orientation of the locking recess 16 can be chosen suitably to produce this.

[0033] Figure 3(c) shows the left end of the coupling body 19, with the left shaft portion 2' not present. The end face of the plug 30, and the locking key recess 16 therein can be seen. The tapered flange segments 12 may also be seen - and these are shown uncompressed since the locking flange nut 3 has not yet been tightened.

[0034] Figure 2 illustrates another embodiment of a swimming paddle 21 of the present invention. This is generally similar to the embodiment of Figure 1, and only the differences will be described.

[0035] The swimming paddle 21 shown in Figure 2 differs from the swimming paddle 17 shown in Figure 1 primarily in that it is provided with a flotation ball 10. The left shaft portion 2' and the right shaft portion 2 are secured to the flotation ball 10, with one shaft portion being fixed relative to the flotation ball and the other shaft portion 2 being able to rotate relative to the rotation ball about the common axis of the shaft portions. As shown in Figure 3(f), the flotation body 10 is provided with first and second coupling portions 22, 23 for coupling the left and right shaft portions 2, 2' respectively to the flotation ball. One coupling portion 22 comprises a plurality of tapered flange segments 12 and a screw threaded portion 20', so that one shaft portion may be secured to the coupling 22 using a tapered locking nut 3' in the manner described above with relation to the embodiment of Fig-

ure 1. The right shaft portion 2 may be secured to the second coupling 23, by fastening the tapered locking nut 3 onto the screw thread 20 provided on the coupling 23 so as to trap the tapered flange 9 between the second coupling 23 and the locking nut 3. The coupling 23 is again provided with a recess (not shown in Figure 3(f)) corresponding to the recess 14 shown in Figure 3(b). When the right shaft portion 2 is in position, the stop 8 locates in the recess in the coupling 23 in order to limit the rotation of the right shaft portion relative to the flotation ball 10 to a maximum of approximately 180°.

[0036] The coupling 22 for the fixed shaft portion preferably comprises a locking recess 16 (not shown in Figure 3(f)) corresponding to the locking recess of Figure 3(c) and 3(d), to enable the fixed shaft portion 2' to be at a predetermined orientation to the coupling 22.

[0037] As shown in Figure 8(a) and 8(b), the flotation ball 10 acts as a pivot for the paddle 21. The upwards buoyancy force tends to maintain the flotation ball at the surface of the water. If the right blade 2 of the paddle is put deeper into the water, as shown in Figures 8(a) and 8(b), the left blade 2' of the paddle rises out of the water in consequence of the buoyant effect of the flotation ball.

[0038] The flotation ball 10 also acts to reduce the resistance encountered by the user, since the flotation ball acts so as to part the water in front of the swimmer. The user is therefore able to achieve greater speed, because of the reduced water resistance. A further advantage of the water flotation ball is that the paddle 21 may act as a safety device, since the flotation ball 10 provides the user with buoyancy in a similar manner as if the user were wearing a life jacket.

[0039] The flotation ball 10 may be provided with a rubber fender 11 that runs around its circumference, in order to protect the flotation ball against damage arising from impact with, for example, under water objects or from damage if dropped on the ground.

[0040] In a preferred embodiment the flotation ball may comprise two separate portions 10a, 10b (although in principle a one-piece flotation ball may be used). In this embodiment the fender 11 may also act as a sealing ring to join the two portions of the flotation ball together and make a water-tight seal between the two portions 10a, 10b. This embodiment allows the two portions to be separated for transport and storage. It also enables the two portions to be separated to allow a starlight positioning device or radar reflective material, for example, to be installed within the flotation ball.

[0041] The flotation ball 10 may be made of a transparent material. It will then act as a mask, and improve the swimmer's under water vision.

[0042] The flotation ball may alternatively be coloured in a bright colour, or may be fluorescent, to enable the swimmer to be clearly seen. Additionally or alternatively, the flotation ball may alternatively consist of or contain a radar-reflective material. This improves the user's safety, since they are easier to locate in an emergency.

[0043] A swimming paddle of the present invention may easily be disassembled for transport and storage, and may easily be assembled for use when desired. In order to disassemble the paddle shown in Figure 1 or 2, it is simply necessary to unscrew the locking flange nuts 3, 3' from their respective screw threads 20, 20'. This enables each shaft portion to be removed from the coupling body 19, or from the flotation ball 10. The flotation ball 10 may also be disassembled, if it comprises two portions. The two shaft portions (with attached blades) and the coupling body 19 (in the embodiment of Figure 1) or the flotation ball 10 (in the embodiment of Figure 2) can then be stored and transported more easily than can an assembled paddle. The paddle may be reassembled simply by inserting the shaft portions 2, 2' into the coupling body 19 or the flotation ball 10, and screwing the locking flange nuts 3, 3' onto the respective screw threads 20, 20'.

[0044] A paddle of the present invention has a very simple and reliable system for mounting the shaft portions onto the coupling body 19 or the flotation ball 10. In particular, when the shaft portion 2 rotates relative to the coupling body 19 or the flotation ball 10, wear is most likely to occur on the tapered face of the bush 9 and the internal tapered face of the coupling flange nut 3. Wear on these tapered faces may be simply taken up by appropriately tightening the locking nut 3 when the paddle is assembled. Furthermore, in use the external tapered face of the bush 9 will be in contact with the internal tapered face of the locking flange nut 3, and this prevents foreign bodies from entering the bearing and causing wear and damage.

[0045] It should be noted that the particular couplings described in the application are not limited to use in a paddle, and may be applied in general to a shaft having two shaft portions that are substantially aligned along a common axis and are able to rotate relative to one another about the common axis. Moreover, the particular couplings described in this application are not limited to a shaft provided with a limit means, and the stop 8 could in principle be omitted.

[0046] The components of the paddle may be made of any suitable material that will withstand corrosion and has sufficient strength, for example plastics materials, composite materials or metals. The shaft portions 2,2' are preferably in the form of hollow tubes, sealed at both ends so that trapped air inside the shaft portions provides buoyancy, and may be made from aluminium.

[0047] In the embodiments of the paddle described above the relative rotation of the two blades is limited to a maximum of approximately 180°. It should be noted that while the maximum relative rotation of the blades is preferably 180°, since this gives the best performance for the paddle, the invention is not limited to an exact limit of 180° for the maximum relative rotation. A maximum rotation that is a few degrees greater or lower than 180° will (although in principle undesirable) give acceptable performance.

Claims

1. A paddle comprising: a shaft; a first blade (1) mounted on a first end of the shaft; and a second blade (1') mounted on a second end of the shaft; wherein the first blade (1) is able to rotate, in use, about the axis of the shaft relative to the second blade (1'); and further comprising limit means (9,14) for limiting the rotation of the first blade relative to the second blade to approximately 180° or less.

2. A paddle as claimed in claim 1 wherein the shaft comprises a first shaft portion (2) and a second shaft portion (2'), wherein the paddle further comprises coupling means (19;22,23) for coupling the first shaft portion (2) and the second shaft portion (2') such that the first shaft portion (2) can rotate relative to the second shaft portion.

3. A paddle as claimed in claim 2 wherein the coupling means couples the first and second shaft portions (2,2') such that the axis of the first shaft portion (2) is substantially coincident with the axis of the second shaft portion (2').

4. A paddle as claimed in claim 2 or 3 wherein the limit means (9,14) are provided on the coupling means and limit the rotation of the first shaft portion relative to the second shaft portion.

5. A paddle as claimed in any preceding claim and comprising a flotation ball (10).

6. A paddle as claimed in claim 5 when dependent on claim 2 or on any claim directly or indirectly dependent therefore wherein the coupling means (22,23) is mounted on the flotation ball (10).

7. A paddle as claimed in claim 5 or 6 wherein the flotation ball is transparent.

8. A paddle as claimed in claim 5 or 6 wherein the flotation ball is fluorescent.

9. A paddle as claimed in claim 5, 6, 7 or 8 wherein the flotation ball comprises or contains radar-reflective material.

10. A paddle as claimed in any preceding claim and comprising first and second hand-grips (5,5') disposed adjacent a respective one of the first and second blades (1,1').

11. A paddle as claimed in claim 10 wherein each handgrip has an asymmetric external cross-section.

12. A paddle as claimed in claim 11 wherein each handgrip has an external cross-section that is substantially oval.

13. A paddle as claimed in claim 10, 11 or 12 wherein each handgrip has an internal cross-section greater in one direction than in a perpendicular direction.

14. A paddle as claimed in claim 13 wherein each handgrip has an internal cross-section that is substantially oval.

15. A shaft comprising: a first shaft portion (2); a second shaft portion (2') and coupling means (19;22,23) for coupling the first shaft portion (2) and the second shaft portion (2') such that the first shaft portion (2) can rotate relative to the second shaft portion; wherein the shaft further comprises limit means (9,14) for limiting rotation of the first blade relative to the second blade to approximately 180° or less.

16. A shaft as claimed in claim 15 wherein the first shaft portion (2) comprises a tapered flange (9), and the coupling means comprises a retaining means (3) having a face with a complementary taper.

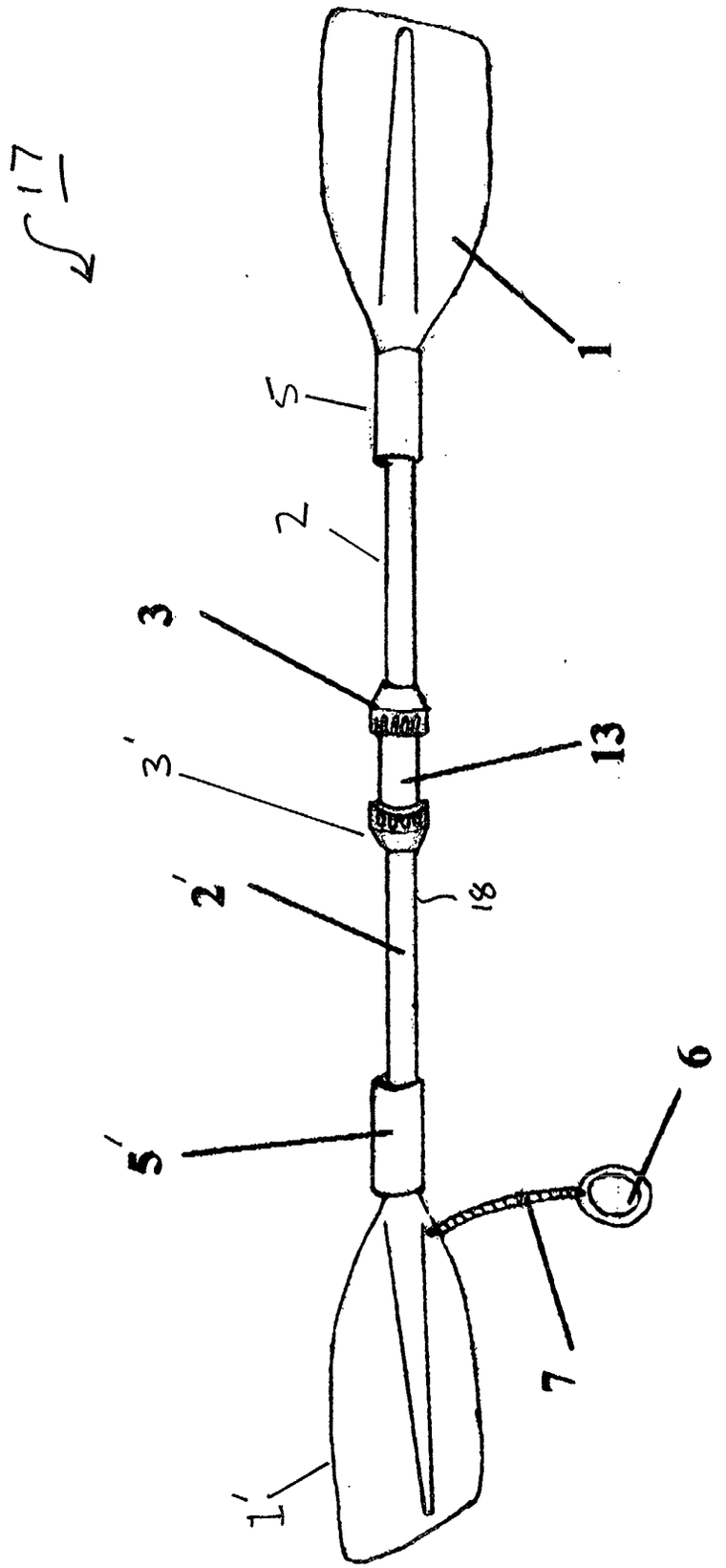
17. A shaft comprising: a first shaft portion (2); a second shaft portion (2); and coupling means (19;22,23) for coupling the first shaft portion (2) and the second shaft portion (2') such that the first shaft portion (2) can rotate relative to the second shaft portion; wherein the first shaft portion (2) comprises a tapered flange (9), and the coupling means comprises a retaining means (3) having a face with a complementary taper.

18. A hand grip for a shaft, wherein the hand grip has an internal cross-section greater in a first direction than in a second direction, the second direction being perpendicular to the first direction; wherein the dimension of the internal cross-section along the second direction is chosen so that the hand grip grips, in use, the shaft; and wherein application of a compressive force along the first direction causes a reduction of the grip of the hand grip on the shaft.

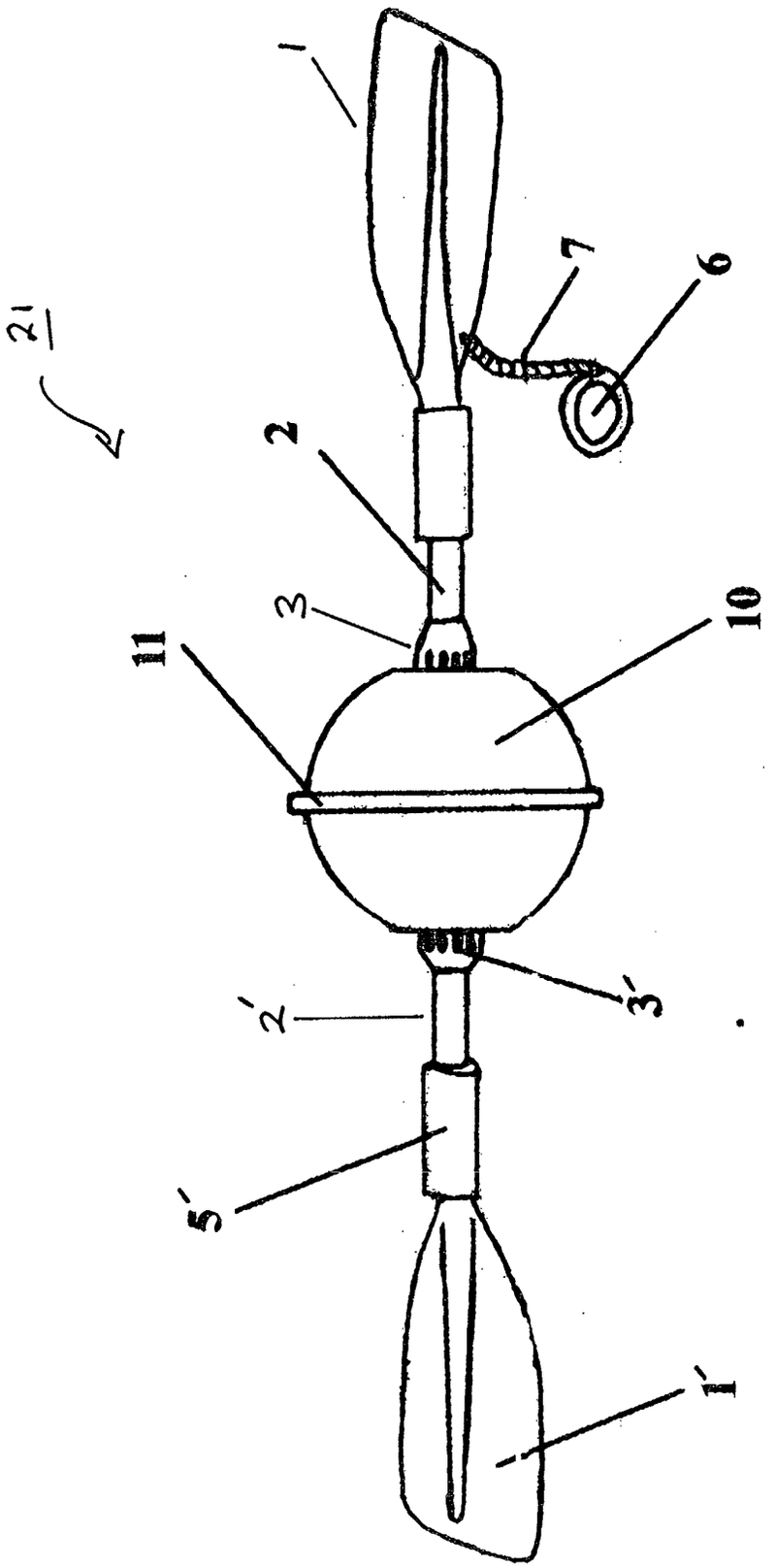
19. A hand grip as claimed in claim 18 and comprising a resilient material.

20. A hand grip as claimed in claim 18 or 19 and having an asymmetric external cross-section.

[Fig 1]



[Fig 2]



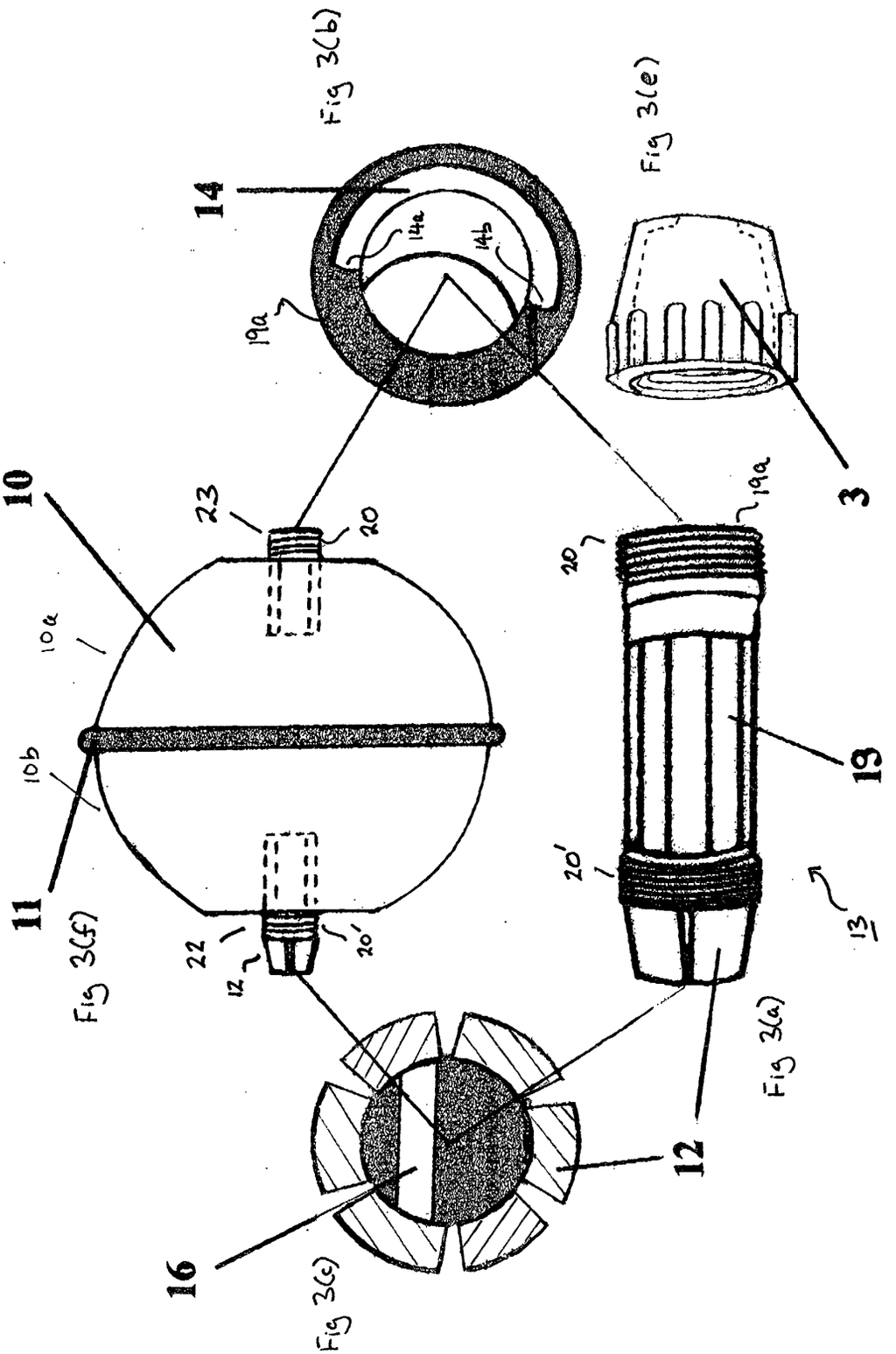
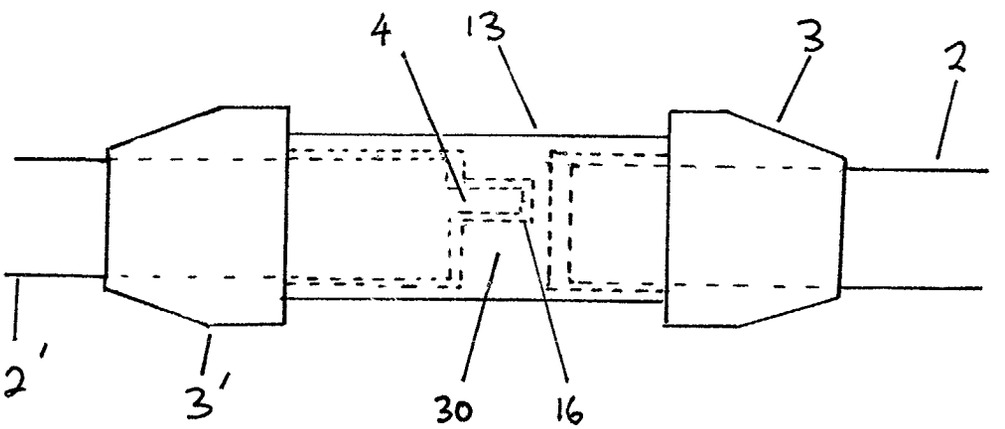
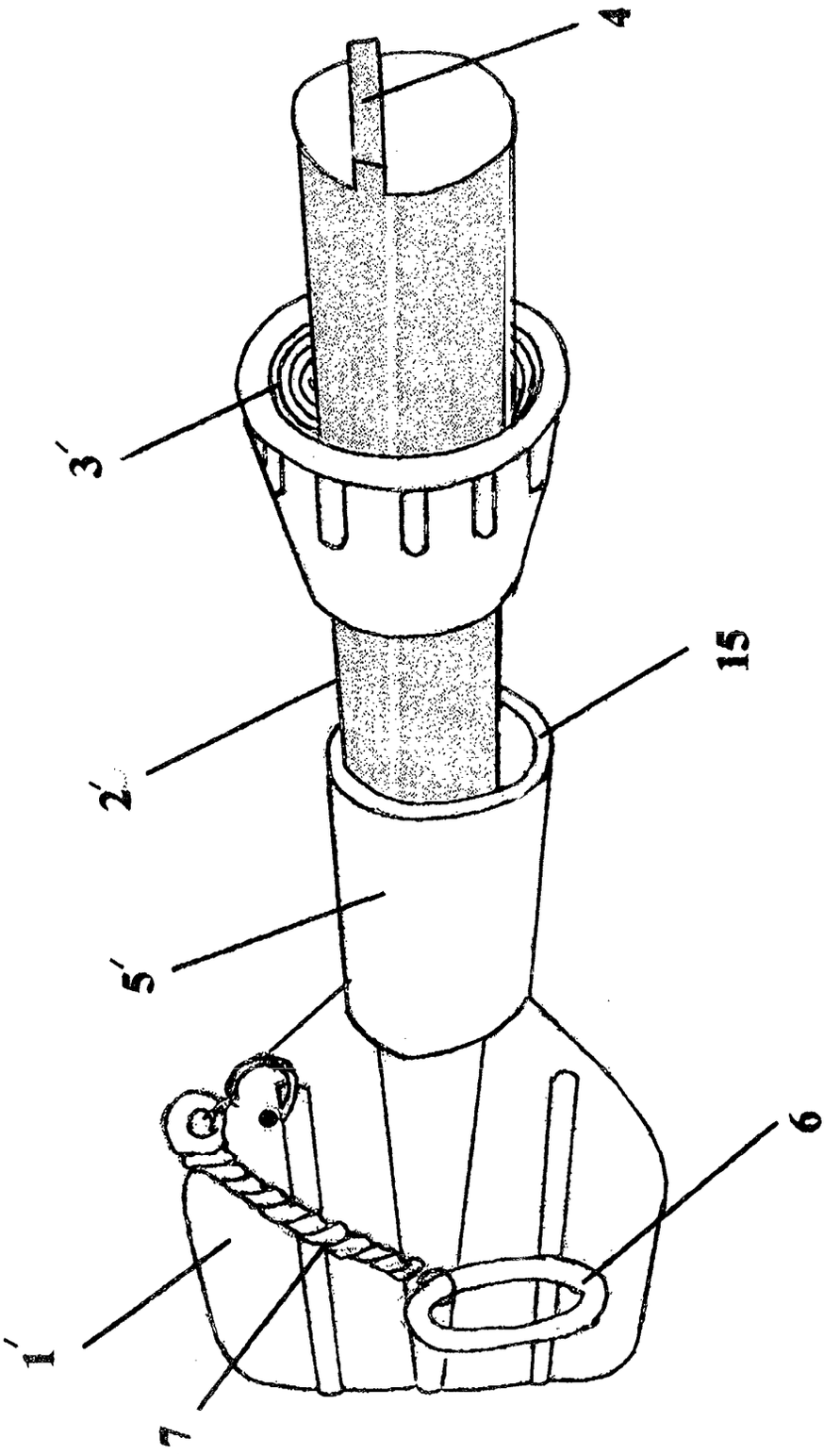


Fig 3(b)
14
14a
14b
19a
Fig 3(e)
3
10
23
20
10a
10b
11
Fig 3(f)
22
12
20'
16
Fig 3(c)
20
19a
19
20'
13
12
Fig 3(a)

Fig 3(d)



[Fig 4]



[Fig 5]

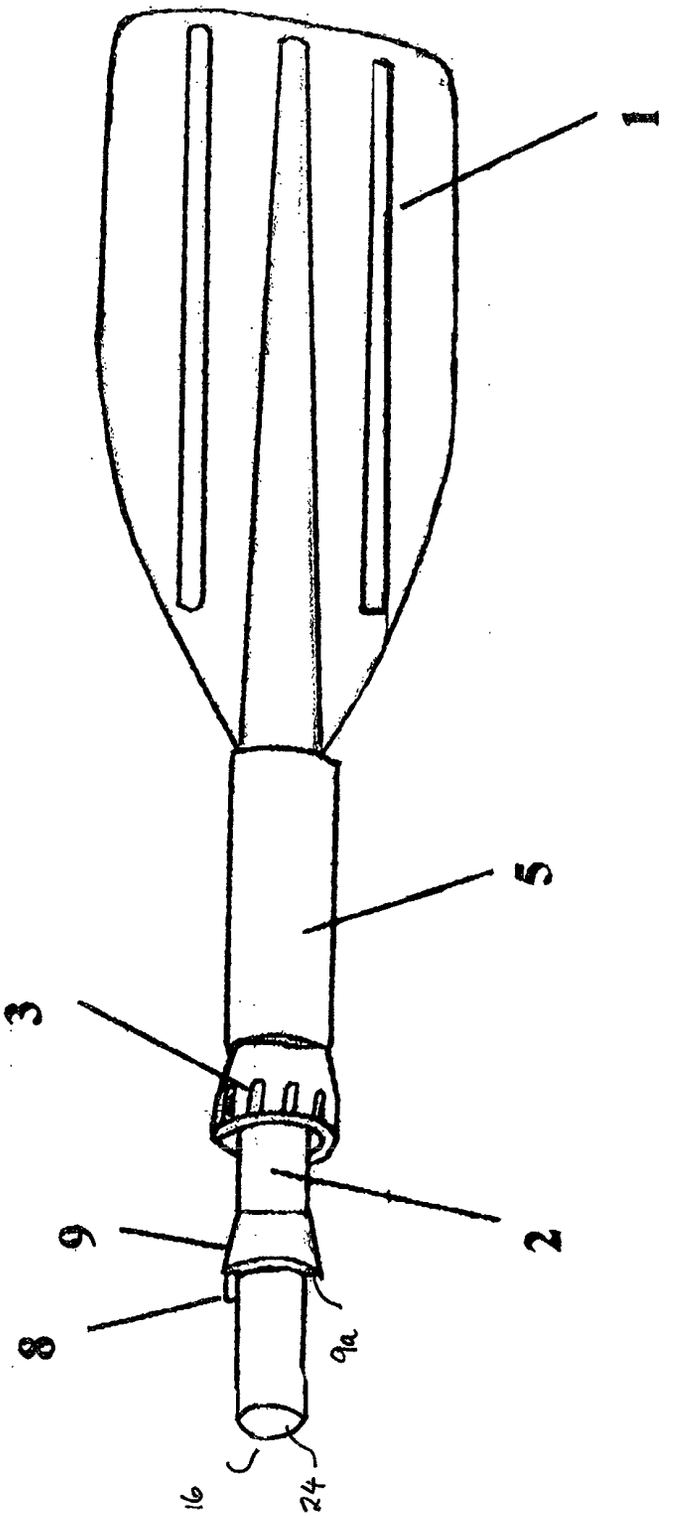
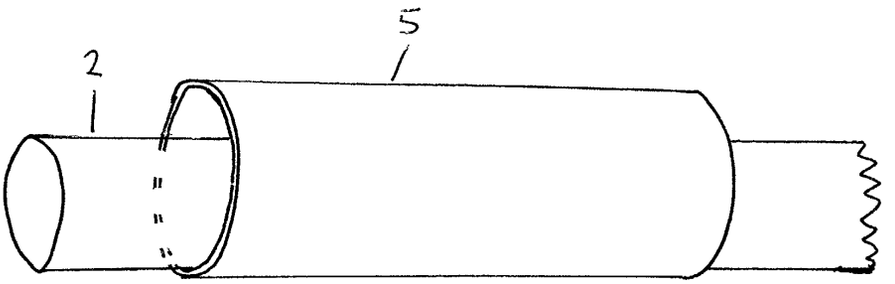
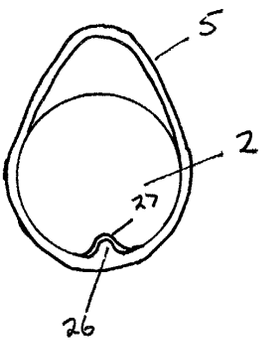


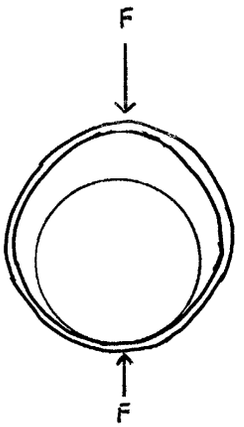
Fig 6(a)



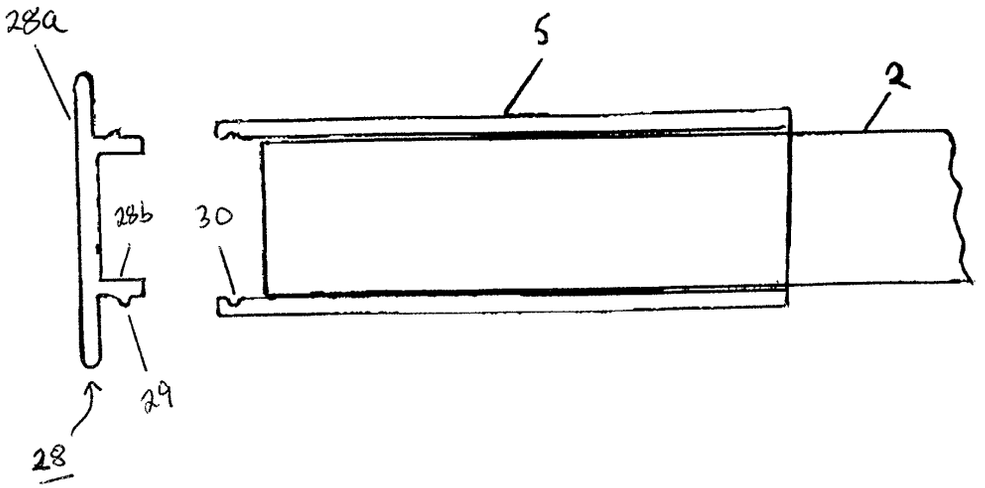
6(b)



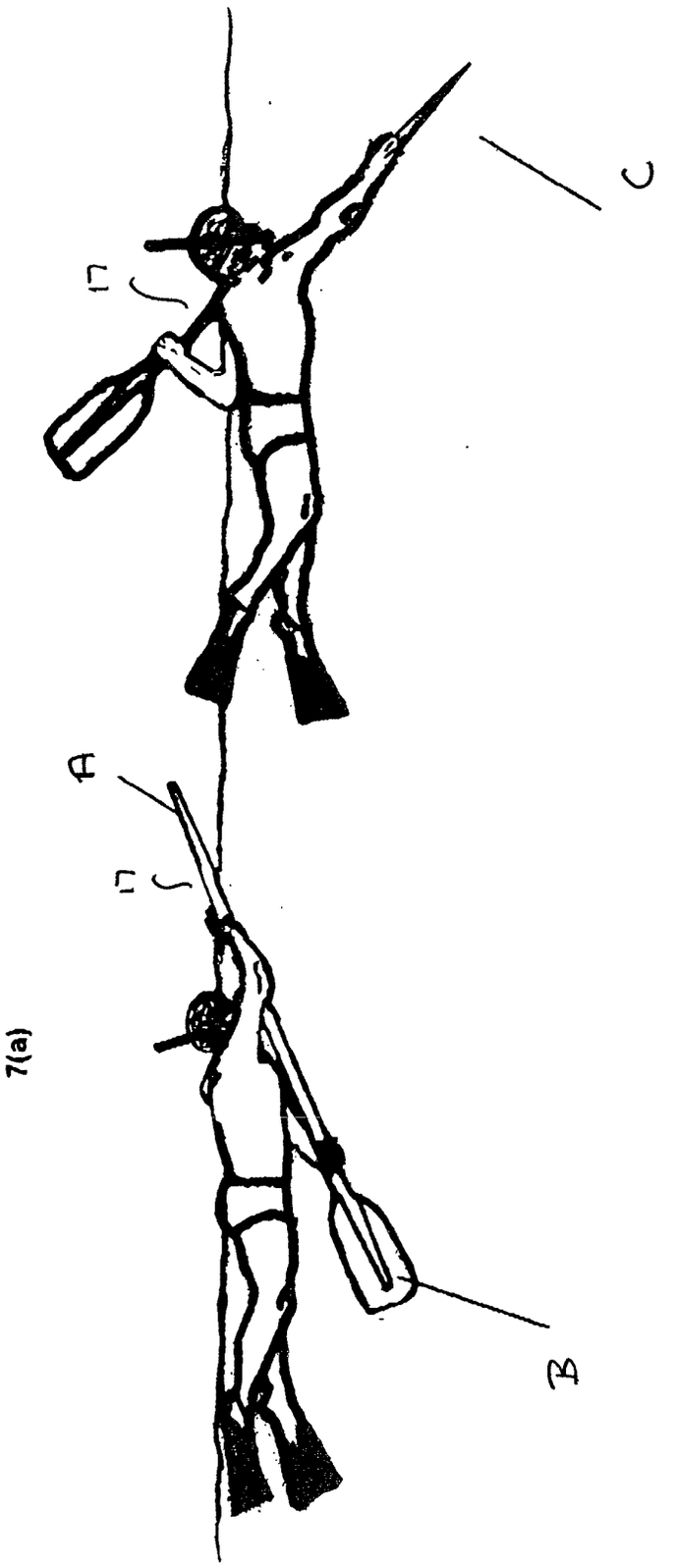
6(c)



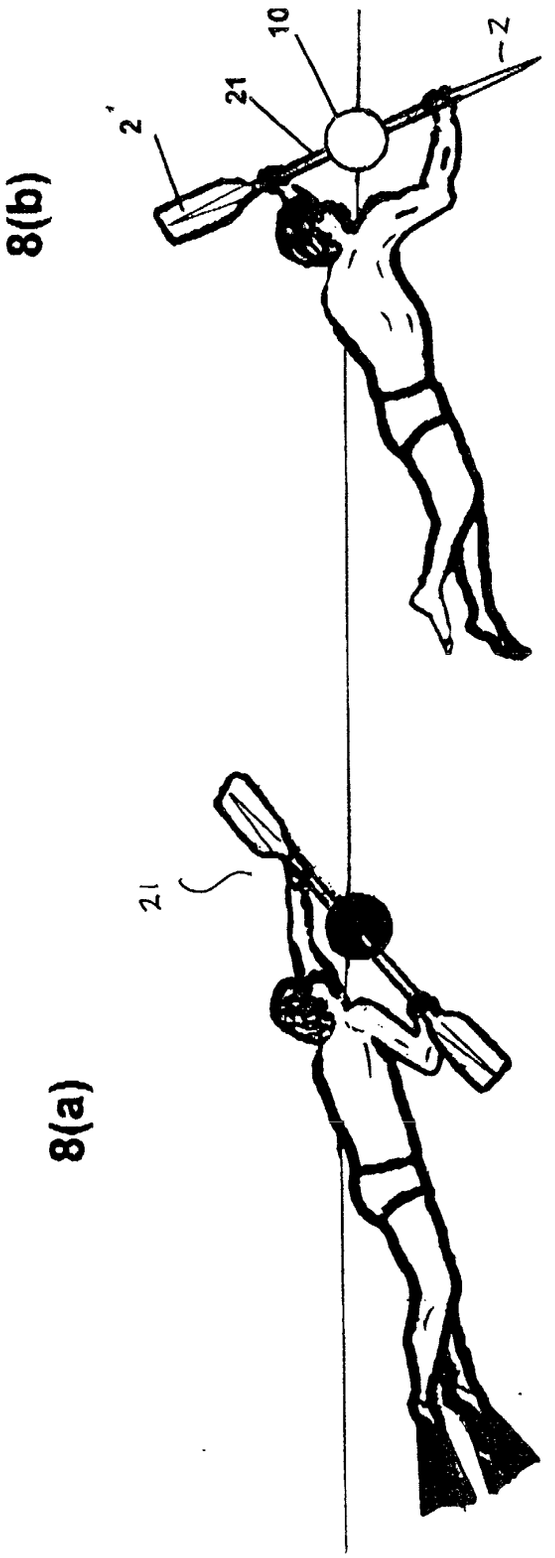
6(d)



[Fig 7]



[Fig 8]



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 3041

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
D,X Y	US 3 052 897 A (MARTIN JAMES L) 11 September 1962 (1962-09-11) * column 2, line 7 - line 70; figures 1,5 * ---	1-4,10, 15 5-9, 11-14	A63B35/06 B63H16/04
Y A	FR 2 545 725 A (CHARLES SERGE) 16 November 1984 (1984-11-16) * page 1 - page 3; figures 1,2 * ---	5-9 1-3,10	
X Y	US 6 328 617 B1 (GUNNELL LANCE F) 11 December 2001 (2001-12-11) * column 5, line 62 - column 6, line 38; figures 1,5-7 * * column 7, line 27 - line 62 * ---	18-20 11-14	
A	US 2 941 219 A (IRVING JAMES H) 21 June 1960 (1960-06-21) * column 1, line 52 - column 2, line 53; figures 2,4 * ---	1-3,5,6	
A	GB 2 361 215 A (BAILEY MICHAEL ;KENNEDY RICHARD (GB)) 17 October 2001 (2001-10-17) * abstract; figure 1 * ---	5,7-9	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A63B B63H
X A	US 6 022 255 A (LUKANOVICH LOUIS) 8 February 2000 (2000-02-08) * abstract; figures 1,3 * ---	17 2,3,15, 16	
A	US 1 107 169 A (KERNS E. J.) 11 August 1914 (1914-08-11) * page 1, line 95 - line 109; figures 1-4 * ---	1,2,4,15	
E	GB 2 368 290 A (WELLS RAYMOND ;WELLS RAYMOND (IT)) 1 May 2002 (2002-05-01) * the whole document * -----	1-20	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 November 2002	Oelschläger, H

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

European Patent Office

Application Number
EP 02 25 3041

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 02 25 3041

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-14

a paddle, comprising a shaft, a first and a second blade, wherein the first blade is able to rotate, and limit means for limiting the rotation of the first blade relative to the second blade to approximately 180° or less.
(object: to provide a paddle whereby the user knows whether the blades of the paddle are in the correct orientation relative to one another; cf p. 2, last line, to p. 3, line 2)

2. Claims: 15-16

a shaft, comprising a first and a second shaft portion, and coupling means such that the first shaft portion can rotate relative to the second shaft portion, and limit means for limiting the rotation to approximately 180° or less.
(object: to provide a coupling of two portions of a shaft such that they are aligned substantially along a common axis; cf. p. 8, lines 4 and 5, and p. 13, line 26, to p.14, line 3)

3. Claim : 17

a shaft, comprising a first and a second shaft portion, and coupling means such that the first shaft portion can rotate relative to the second shaft portion, wherein the first shaft portion comprises a tapered flange, and the coupling means comprises a retaining means having a complementary tapered face.
(object: to provide a rotateable mounting of the shaft portion to the coupling body; cf. p. 9, lines 10 and 11)

4. Claims: 18-20

a hand grip, wherein the hand grip has an internal cross-section greater in a first direction than in a second, perpendicular direction, and wherein application of a compressive force along the first direction causes a reduction of the grip.
(object: to provide a hand grip with loosable grip to adjust the position of the hand grip; cf. p. 6, lines 4 and 5, and p. 7, lines 6 and 7)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 25 3041

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-11-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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FR 2545725 A	16-11-1984	FR 2545725 A1	16-11-1984
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US 6022255 A	08-02-2000	NONE	
US 1107169 A		NONE	
GB 2368290 A	01-05-2002	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82