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(54) **APPARATUS FOR SWIMMING AND DIVING TOWED BY A BOAT.**

(57) The rudder is comprisied of a planar body (1) wherein a large front notch (3) and a rear notch (6) form two lobes or side wings which are perfectly symmetric with respect to the front-to-rear axis (11). On said axis and at the vicinity of the front notch (3) is provided the unique point of towing (4), variable through a movable part (10), to which is fixed the corresponding towing line. On each side wing, there are arranged, symmetrically and forward of the towing point, two windows (7) that the user can grip with his or her hands and, behind said windows, in the lower part of the device and also in a symmetrical arrangement there are provided two rudder-like fins (8). Said apparatus can be gripped manually with the arms extended forwards and allows a swimmer-diver to move on the water or in the water.

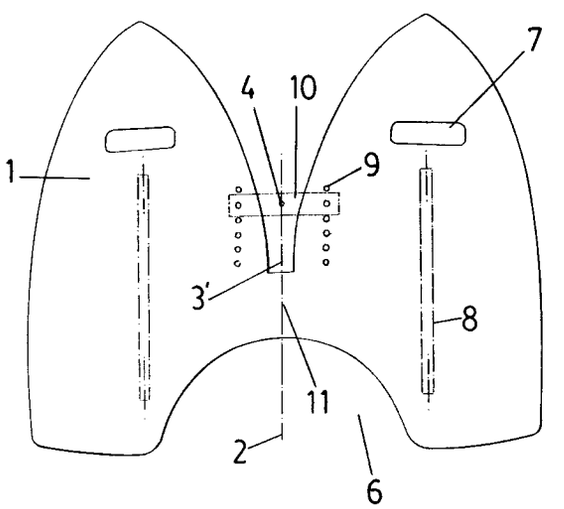

FIG. 5

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OBJECT OF THE INVENTION

The present invention refers to an apparatus that has been conceived and structured in order to allow one to perform a new water sport and that, convenient towed, permits a person to do exercises of riding on the surface of water and of underwater swimming, with the possibility of controlling one's own movements by tilting the apparatus or rudder vertically and transversally as well as in combination, specifically to achieve lateral movement of the body in terms of the imaginary path defined by the tractor vehicle, as well as upward and downward movements in the water.

BACKGROUND OF THE INVENTION

There are a large number of sports and activities performed in water, some are performed on the surface and others under water. Within this braod range of possibilities groups of sports can be established, one of which is based exclusively on human skill, without any other type of element, group which includes swimming, waterpolo, apnea diving, etc. A second group adds to the cited human skill the use of floating elements, and in this sense, "paragüismo", sailing, surfing, wind-surfing, etc. can be cited. There is a third group in which aside from the above cited human skill, floating and mechanical elements are combined, such as for example, motorized sailing boards, water-skiing, etc. There is a fourth group in which elements which permit one to stay underwater, such as diving, skin diving with air tanks, etc., are used.

Specifically within the scope of sports that combine floating and mechanical elements, in which the object of the invention fits, the possibilities that these types of sports permit are rather restricted, since specifically in the scope motorized sailing, it is simply a question of driving vehicles on the surface of water, in a way relatively similar to how driving is done on the ground, specifically without the possibilities of immersion, and the same thing is true for water skiing, where the skier can only try to achieve a speed record on water, towed by the corresponding boat.

DESCRIPTION OF THE INVENTION

The combined rudder that the invention proposes, as it has just been stated, could be placed in the group of sports in which floating and mechanical elements are combined, but offering a considerably higher level of possibilities than the above cited group of sports, in addition to being completely novel possibilities.

In a more specific manner and as it has already been stated, the combined rudder that is proposed allows for riding on the surface of water, with control of lateral movement similar to that of water skiing, although at a slower speed, and likewise underwater swimming, with the same control of lateral movement and with a parallel control of the level of depth, either with the limitation of having to come up periodically for air, or else without this need upon using air tanks for breathing purposes.

More specifically, the combined rudder that is proposed is structured from a flat body, made of a suitable light and resistant material, in which two side lobes perfectly symmetric with regard to the antero-posterior axzis of the body, are defined, in such a way that in correspondence with said axis a broad front notch which provides access to a sole traction point located upon said axis is defined, and a rear structure that permits the device to be placed in front of the swimmer's-diver's head, when he grasps the apparatus with his arms extended, in the normal usage position, without any risk of the flat body hitting his head.

In each one of the two side wings or lobes of the cited flat body, aligned transversally and placed in front of the traction point, two transversal windows suitable formally and dimensionally to permit one to insert one's fingers in order to grip the apparatus in a normal fashion, the rear edge of said windows having the possibility of being shaped anatomically in order to make it easier to grip same.

Finally and as a complement of the described structure, in each one of these two lobes or wings of the sheetlike body, on the bottom surface thereof and preferably behind the cited windows, both fins are established. These fins will preferably adopt an arrangement perpendicular to the flat body, but they can likewise adopt an oblique arrangement, enhancing controllability of the apparatus in any case.

Obviously not only the two lobes or wings of the flat body should be perfectly symmetric to the antero-posterior axis of the apparatus, without the cited windows and fins also having to adopt perfectly symmetric positions, in order to ensure a suitable balance, it being obvious that the larger the distance between the traction point and the transversal line corresponding to the windows defining the hand grips, the greater the maneuverability of the apparatus, but this maneuverability will be more difficult, requiring some better physical conditions and greater mastery, for which reason the existence of different apparatus, suitable to different levels of use, from beginners up to real experts, or optionally the arrangement of a sole apparatus in which the traction point is unrelated to the flat body, has been provided for, being established on a small transversal bridge with adjustable

positioning all along the axis of the apparatus, so that each user, in terms of his own possibilities and criteria, will place said bridge in the working position considered most convenient.

DESCRIPTION OF THE DRAWINGS

In order to complete the description that is being made and for the purpose of providing a better understanding of the characteristics of the invention, the present specification is accompanied by a set of drawings, as an integral part thereof, in which the following has been represented in an illustrative and non-resrictive manner:

Figure 1.- It shows a plan view of the combined rudder for underwater swimming and riding on the surface, made in accordance with the object of the present invention.

Figure 2.- It shows a front raised view of the same combined rudder.

Figure 3.- It shows a side raised view, in which the windows corresponding to the grips of the apparatus have been represented with a broken line.

Figure 4.- According to a schematic and perspective view, it shows an example of practical use of the combined rudder of the above figures.

Figure 5.- Finally, it shows a plan view similar to that of figure 1 but corresponding to a combined rudder with an adjustable traction point.

PREFERRED EMBODIMENT OF THE INVENTION

In view of these figures it can be seen how the apparatus that is proposed is structured from a considerably flat body (1), which as it has been said above will be made out of a light and resistant material, such as suitable rigid plastic material, for example, whose contour adapts a shape relatively similar to that of a butterfly, with its wings extended, it being perfectly symmetric to the imaginary antero-posterior axis thereof (2) and defining in the same a deep front notch (3), which approaches the traction point of the apparatus, materialized in a simple hole (4), to which the wire or towline (5) that connects said apparatus with the boat towing the same, also include another broad outer notch (6) which, as is also seen in figure 4, enables movement of the user's head, without the risk of hitting his head on said flat body, in the normal tilting of the arms to maneuver the apparatus.

In each one of the side wings or lobes of this flat body (1) and in the front, a transversal window (7) is established. Window (7), as can also be seen in figure 4, constitutes the grips of the apparatus, so that the user will rest his arms on the top surface of said lobes, passing his fingers through these windows.

Complementary to the bottom surface of the flat body (1) and in each one of its lobes, a longitudinal fin (8), that can have the triangular shape represented in figure 3 or any other shape that is considered convenient, is established. Likewise, these fins (8) can be perpendicular to the flat body (1), as seen in figure (2), or form any other suitable angle with the flat body, without this affecting the essence of the invention.

The windows (7), that adopt just like the fins (8) positions perfectly symmetric to the antero-posterior axis (2), will be preferably slanted slightly outward and backward for the purpose of attaining a perfect placement for one's hands, taking into consideration the slightly diverging position that the user's arms must adopt in turn and that also appear represented in the above cited figure 4.

As it has already been pointed out above, the distance between the imaginary line that connects the two side windows (7) and the traction point (4) determines the degree of maneuverability of the apparatus, which is greater the greater this distance is, though this requires some better physical conditions and greater experience. Hence, it is implied that while initially, that is to say for beginners, this distance must be minimal, the same must increase progressively with the user's experience. In this sense and in accordance with the representation of figure 2, a variant of the embodiment of the apparatus in which the cited front notch (3') is considerably deeper, establishing on both sides of the same both alignments of holes (9) that permit fastening, with the possibility of positional adjustment, for a transversal bridge (10) that is that which includes the traction point (4), has been provided for. This bridge (10) can be positioned in any suitable position by means of screws or any other suitable fastening means.

Furthermore, the portion (11) established between the front notch (3) and the rear notch (6) can be delimited in such a degree that to normal antero-posterior and side tilting movements for the flat body (1) a relative tilting movement between the side wings or lobes thereof can be added, which obviously permits one to make "spirals" under the water, though obviously this possibility is reserved for real expert sportsmen.

In accordance with the above, the user gripping the apparatus with his hands, as is shown in figure 4, can ride on the surface of the water, dive underwater, swim underwater and come up for air voluntarily, with a minimal effort and without any more conditions, in principle, than those of a non-specialized swimmer-diver. As one gains experience and improves his skill, the possibilities are multiplied progressively, the limits being set by the sports-

man's physical capacity and playfulness.

The structure is designed in accordance with all safety regulations, it being impossible for the same to injure the user, since it is always in front of him, the grips being designed ergonomically, for easy grip as well as for the loss of grip, freeing pressure from one's hands, there being no impediment at all that permits separation from the motorboat and its moving away at will. The profiles, curves and ends have smooth and rounded shapes, incapable of causing the minimal injury or scratches on the user's skin.

The material forming the apparatus will have the density required to ensure optimal floatability and submergibility, allowing the swimmer to rest while being supported and without requiring great effort in underwater swimming.

The underwater swimming can be done apnea with goggles and a snorkel, or with breathing with air tanks.

It permits several people to sail parallel, just like in water skiing with the required separation in the pulling points of the motorboat.

The speed of the motorboat and the length of the traction line (5) are elements that will logically affect in a directly proportional manner the speed of riding on the water and the scope of possible maneuverability.

The scope of maneuverability is circumscribed in a semi-circle, base of a cone whose vertex is the traction point of the motorboat. The diameter of this semicircle will be larger or smaller depending on two parameters, on the one hand the riding speed and on the other hand the length of the towing line. The longer the line and the slower the speed, within the required minimun, the possible maneuverability diameter increases. Likewise, the maneuverability response will be a result of the riding speed; at maximum possible speeds the responses to the changes of direction will be rapid and spectacular, similar to maneuvers of dolphins.

The riding speed necessary is variable, varying between one and eight knots, which permits easy enjoyable riding and even acrobatics. Higher speeds will be possible for experienced skin divers, equipped with diving suits and goggles.

The length of the pulling line starts with a minimum of 24 meters for boats with a motor up to 25 HP. With more powerful motors the length will be progressively longer, 2 more meters for each HP increased.

The ease of riding on water and maneuverability, with the minimal effort makes it possible for this apparatus to have multiple uses, among which the following may be cited:

- Gliding and slalom on the surface of water;
- Observing the bottom of the sea, fauna and flora;
- Recreational exercise;
- Entertaining sports;
- Competitive sports;
- Locating sunken bodies and objects;
- Locating wreckage or remains of shipwrecks;
- Underwater photography;
- Filing underwater movies;
- Recreational devices at water installations or underwater amusement parks;
- Underwater sightseeing at reefs or coral beds;
- Recreation and competition on rapids;
- Ski acrobatics and underwater acrobatics, sports and exhibition acrobatics;

It is not considered necessary to make this description any longer in order for any expert in the material to be able to understand the scope of the invention and the advantages that are derived from the same.

The materials, shape, size and arrangement of the elements are vulnerable to variation as long as they do not imply an change of the essence of the invention.

The terms in which this specification has been written should always be taken in a broad and non-restrictive sense.

Claims

1. Combined rudder for underwater swimming and riding on the surface, essentially characterized in that it is comprised of a substantially flat body (1), symmetric to its imaginary anteroposterior axis (2) in which a deep front notch (3) and another rear notch (6) are defined, determining two side rounded lobes or wings, said flat body (1) having on its cited axis (2) and near the front end corresponding to the bottom of the front notch (3), a hole (4) constituting the traction point of the apparatus, by means of the corresponding line (5) and also by means of the corresponding motorboat, while in the lobes or side wings of the flat body, at the front level, rather separated with regard to the traction point (4), both transversal windows (7) and likewise in symmetric positions, formally and dimensionally adequate so that the user can graps the apparatus with his hands through the windows, it being provided for that this flat body includes in its bottom surface and preferably behind the cited windows, both longitudinal fins, preferably with a triangular contour, that can be perpendicular to the flat body or have an arrangement oblique to the latter.

2. Combined rudder for underwater swimming and riding, according to claim 1, characterized

in that the traction point (4) is optionally established upon a movable piece (10), materialized in a small transversal bridge, of positioning adjustable upon the flat body (1), in which case the front notch (3') of the same has a considerably greater depth, locating on both sides of the same alignment of holes (9) for adjustable fastening of said transversal bridge (10.)

3. Combined rudder for underwater swimming and riding, according to the above claims, characterized in that the windows for grasping same with one's hands have ergonomic edges which make it easier to grasp with the hands and to let them go, all the edges of the flat body (1) and of the bottom fins (8) being conveniently rounded determining a total lack of sharp edges that could be sharp.

Amended claims

1. Combined rudder for underwater swimming and riding on the surface that comprises a substantially flat body (1), means (4) (19) for connecting the pulling line (5), at least two gripping means (7) for the user's hands and at least one fin (8) placed on the bottom surface of the body (1), characterized in that said body (1) has, in its horizontal axis (2), a deep front notch (3) and a rear notch (6) that divide said body (1) into two symmetric wings, said gripping means (7) being placed symmetrically in said wings of said body (1); and said connecting means (4) (10) being placed on said horizontal axis (2) in a rear position with respect to said gripping means (7.)

2. Rudder according to claim 1, characterized in that said gripping means (7) are windows (7.)

3. Rudder according to claim 1, characterized in that the traction point (4) is a hole (4.)

4. Rudder according to any claim 1 or 2, characterized in that the traction point (4) is located in an auxiliary piece (10.)

5. Rudder according to any of the claims 1, 2 and 3, characterized in that the traction point is a transversal bridge-shaped piece (10) mounted in holes (9) respectively placed in said wings and in said strip (10.)

6. Rudder according to claims 4 or 5, characterized in that the position of the traction point (4) can be adjusted along the horizontal axis (2.)

7. Rudder according to claims 5 or 6, characterized in that said positions of said piece (10) are defined by lines of consecutive holes (9) placed on both sides of said horizontal axis (2.)

8. Rudder according to claims 5 or 6, characterized in that said piece (10) has consecutive holes by means of which it is coupled to at least two holes (9) in said wings of the body (1.)

9. Rudder according to any of the above claims characterized in that said windows (7) have ergonomical edges to make it easier to grip same or to let go of same, and in that said fins (8) and the edges of said body (1) are rounded causing a total absence of sharp edges.

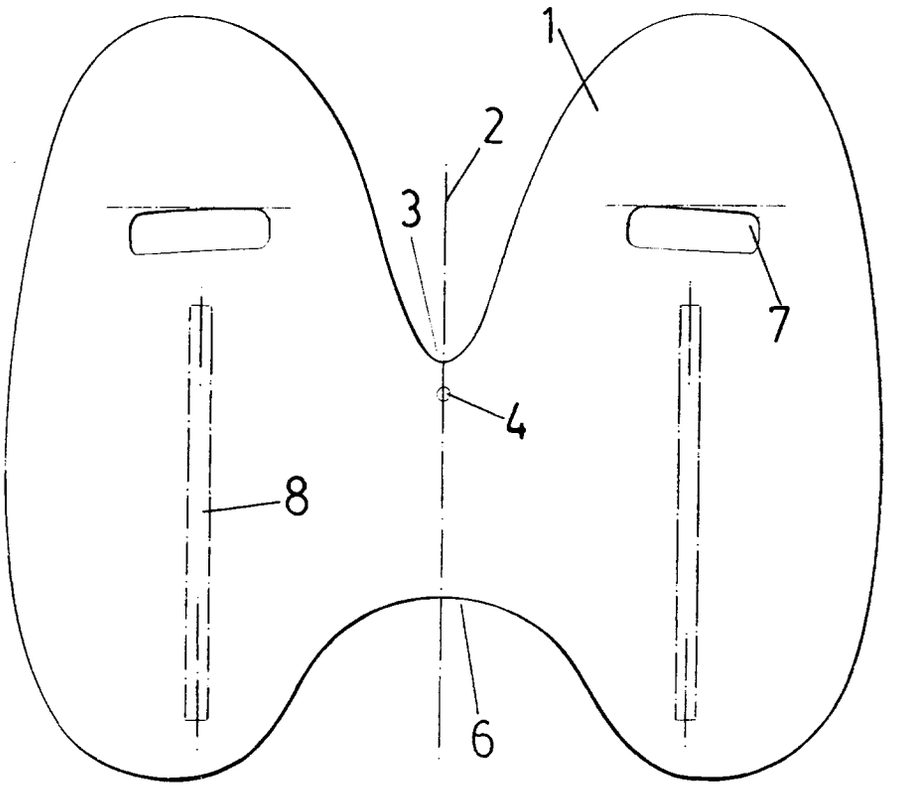

FIG. 1

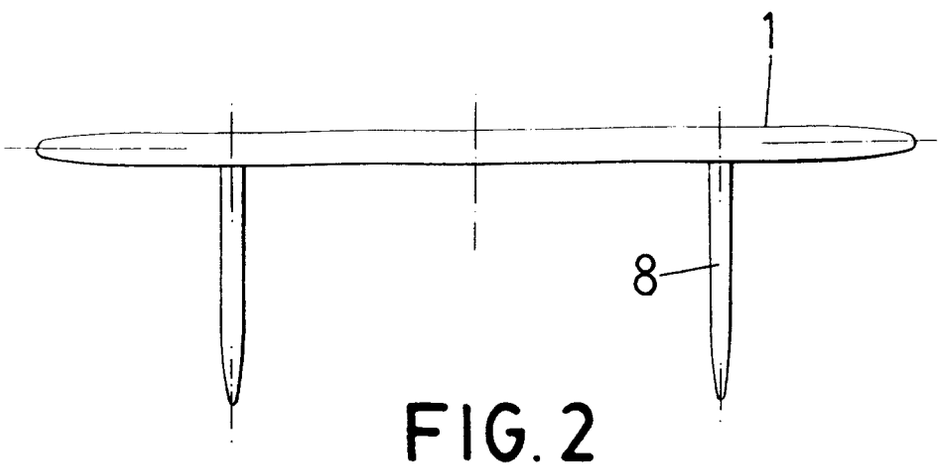

FIG. 2

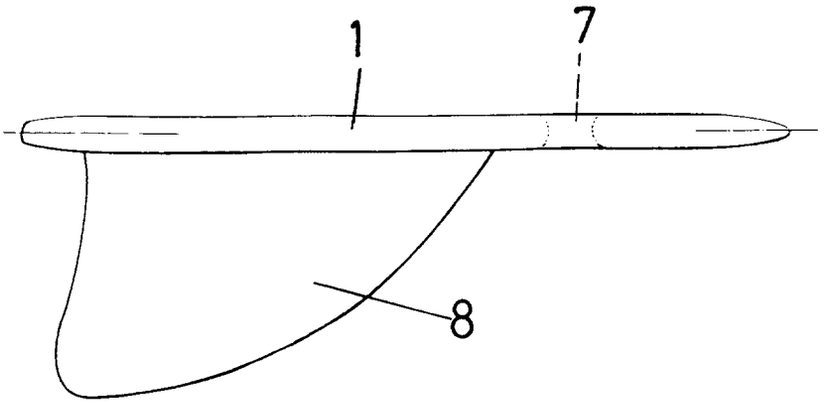

FIG.3

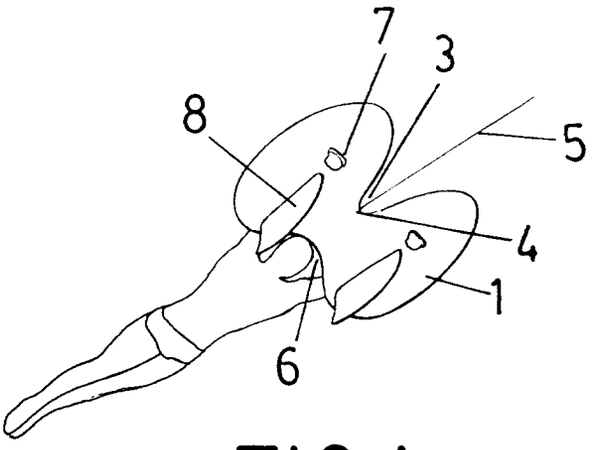

FIG.4

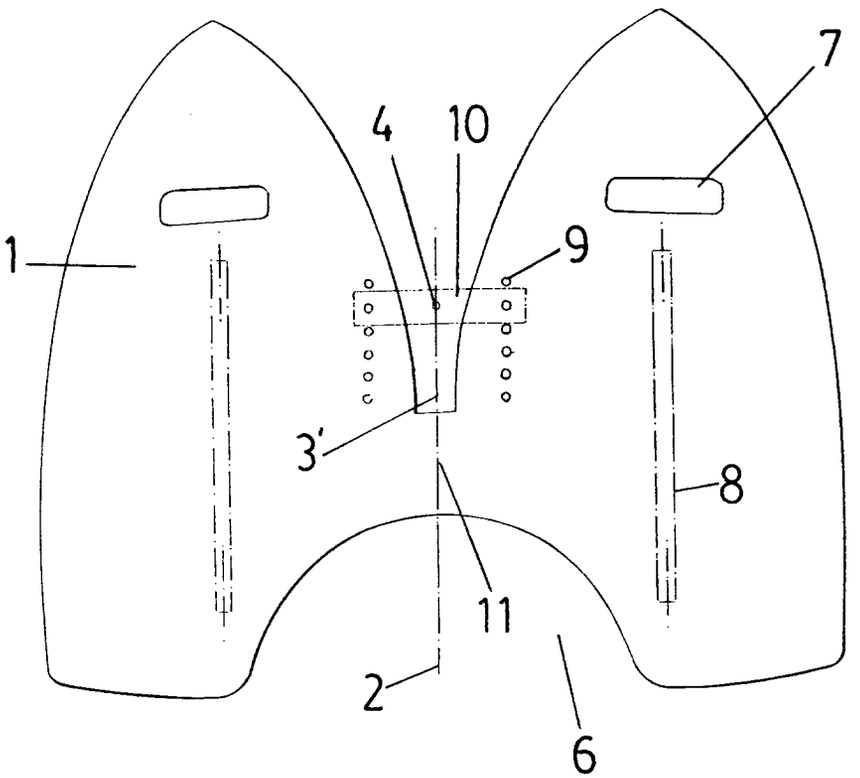

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 93/00044

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5: A63B35/00 ; B63C11/46
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5: A63B; B63B; B63C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR,A, 2 635 307 (HUGEL ET AL.) 16 February 1990 see page 3, line 11 - line 31; page 5, line 33 - page 6, line 27; abstract; figures	1
A	US,A, 4 207 829 (MEISTER ET AL.) 17 June 1980 see the whole document	1
A	US,A, 4 149 483 (SCOTT, JR) 17 April 1979 see the whole document	1
A	FR,A, 2 210 170 (COUREUR) 5 July 1974 see the whole document	1

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2nd August 1993	August 17, 1994 (17. 08. 93)
Name and mailing address of the International Searching Authority: ISAT EP	Authorized officer: GIMENEZ BURGOS R.

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