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(71) Applicant:
Investigacion y Transferencia de Tecnologia, S.L.
28291 Los Penascales - Las Rozas de Madrid (ES)

(72) Inventor: **GARCIA RAMOS, Evaristo**
E-28291 Los Penascales - Las Rozas de Ma (ES)

(74) Representative:
Ungria Lopez, Javier et al
Avda. Ramon y Cajal, 78
28043 Madrid (ES)

(54) ALARM CLOCK

(57) Improved alarm clork comprising a clock or watch, time display means, alarm means, means for generating a first number, said number being a random number, means for displaying the random number when the alarm goes off, means for displaying a second number, means for manually modifying said second number and/or said first number, and means for stopping the alarm sound when a predetermined relationship between the first number and the second number is displayed, for example when the first number coincides with the second number.

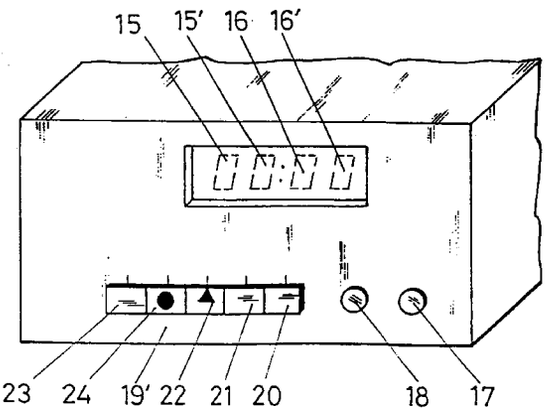

FIG. 3

EP 0 889 382 A1

Description

OBJECT OF THE INVENTION

The present invention refers to an improved alarm clock, which is of the electronic type and it has been conceived and embodied as a means to assure the awakening of the user and even the shaking off drowsiness of the user so that once he is awake he does not fall back to sleep.

The object of the invention is to provide an alarm clock that can be considered to be reliable, given that some manual operations are necessary so that the alarm stops sounding, there must be light in order to carry out such operations, which ensures the awakening.

BACKGROUND OF THE INVENTION

Among the numerous types of alarm clocks, one can mention electronically operated ones that include a screen with four digits, two of which indicate the hour and the other two indicate the minutes, in such a way that changing the time and minutes in order to turn on the clock or the alarm of the alarm clock, is done by two push buttons in combination with a four-position switch, one corresponding to the indication of the hour and minutes of the clock; another one corresponding to the indication of the time when the alarm must sound; another one corresponding to the time when the alarm is to be activated and another one corresponding to the time when the alarm is to be, deactivated so that it stops sounding.

This type of electronic alarm clock that is considered to be a basic one, may prove to be adequate for most people in most situations.

Now then, there are exceptional cases in which an alarm clock like the described one may prove to be inadequate to achieve effective awakening of certain people.

Thus, the type of people who have difficulty in awakening, who once the alarm has sounded push the corresponding turn-off switch and unknowingly keep sleeping, can be mentioned.

On the other hand, there is also the circumstance that on certain occasions the person must be sure that he awakens, such as in the case of having to catch a plane, when an important meeting is to be held early in the morning, etc.

It is clear that in these situations and in other similar ones, a system that ensures the awakening of the above mentioned type of people, would be desirable. However no type of alarm clock capable of ensuring the awakening of a certain type of people is known.

DESCRIPTION OF THE INVENTION

The alarm clock object of the invention ensures the awakening of all those people who have trouble in waking up, and this is achieved by means of an extremely simple but efficient solution.

Basically, the alarm clock of the present invention comprises:

clock means (namely, some type of device or circuitry that serves to count time and to provide some type of signal in terms of the counted time), including means to count time and means to modify said count;

time display means, including means to display two digits indicating the hour and two digits to indicate the, minutes, in order to display the hour and minutes in accordance with the count of the clock means;

alarm means, including means to make the alarm go off when the clock means indicate a specific time, means to preset the time at which the alarm must go off, and means to give off an alarm sound when the alarm goes off;

means to generate a first number, this numbering being a random number;

means to display the random number when the alarm goes off;

means to display a second number;

means to modify manually said second number and/or said first number;

means to allow the alarm sound to stop sounding when a predetermined ratio between the first and the second numbers is displayed. Conveniently, the modification of the first and/or of the second number is done by means of the corresponding push buttons; just as one normally changes the digits of the hour and/or of the minutes when the time shown by the clock or time when the alarm must go off is changed.

According to a possible embodiment, it may be necessary to make the first and the second numbers coincide in order to stop the alarm from sounding, that is to say, the system permits the sounding of the alarm to stop when the displayed second and first numbers coincide.

The means to display the first number may be functionally associated to the first two digits indicating the hour, in such a way that said digits indicate the first number, while the means to display the second number may be functionally connected with the digits indicating the minutes, in such a way that said digits indicate the second number. In this case, it is advisable that the first number, the random number, is a number from 25 to 99, so that it remains clear that the displayed number does not, correspond to the hour, thus avoiding any possibility of confusion. The second number may also be a random number, though it may be practical that said number is a specific number, for example, "00". In this case, it may be especially advantageous that the second number is the number that has to be changed to

make it coincide with the first number.

The clock of the present invention may include:

a screen to display the digits;
a general switch with push buttons to allow at least the following operations to be carried out manually: modify the count of the clock means; preset a time at which the alarm must go off; modify the first number and/or the second number; and turn off the alarm when the first and the second numbers coincide on the screen. It may also have a push button to choose between an alarm mode (in which the alarm goes off at a preset time) and an alarm-free mode (in which the alarm does not go off at a preset time).

Besides, the clock advantageously includes a push button that permits one to choose between a normal operating mode in which it is not necessary to change the displayed numbers in order to stop the sounding of the alarm, and a special operating mode in which the first random number and the second number are displayed, it being necessary to change at least one of said numbers in order to be able to stop the alarm from sounding.

Obviously, there must be light in order to modify the first and/or of the second number and besides the person must be wide awake to do so, since on the contrary, he would be incapable of carrying out the operation. Obviously, this will ensure or guarantee that the person remains awake, since on the contrary, the sound of the alarm will not stop.

Hereinafter, to provide a better understanding of this, specification and forming an integral part of the same, some figures in which the object of the invention has been represented in an illustrative and non-restrictive manner, are attached hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to complete the description that is going to be made hereinafter and for the purpose of providing a better understanding of the characteristics of the invention, a set of drawings based on which one will more easily understand the innovations and advantages of the alarm clock made in accordance with the object of the invention, is attached to the present specification.

Figure 1 shows a block diagram corresponding to the clock of the invention.
Figure 2 is a front view of a conventional electronic alarm clock.
Figure 3 is also a front view of the alarm clock made in accordance with the object of the invention.

PREFERRED EMBODIMENT OF THE INVENTION

As can be seen in the cited figures, and specifically in figure 1, an electronic alarm clock includes a series of main blocks, starting with a filtering block (1), then a frequency selecting block (2), followed by counters (3), (4) and (5) corresponding to seconds, minutes and hours, respectively, blocks (4) and (5) being related to the corresponding alarm comparator (6) to activate the corresponding alarm circuit (7), including, as usual in an alarm clock, a delay countdown block (8), and the corresponding alarm minute counters (9) and the alarm hour counters (10).

Now then, as of the cited block circuit that includes a conventional electronic alarm clock, a generator (11) of a two-digit random number, and a comparator between hours and minutes (12) in connection with the corresponding above mentioned alarm circuit (7) may be included.

Now then, once that which is the corresponding general block diagram of the alarm clock of the invention has been cited, this alarm clock physically includes a body (13) with a screen (14) on which two pairs of digits (15-15') and (16-16') appear, the first two digits corresponding to the hours and the second two to the minutes, appearing on the front of the body (13) of the alarm clock push buttons (17) and (18) to change the digits corresponding to the hours and to the minutes. The body of the alarm clock also includes a general switch (19) in which the push buttons (20), (21), (22) and (23) appear, in such a way that actuating the push button (20) allows the indication of the hours and minutes of the clock to be carried out, by actuating buttons (17) and (18). Actuating push button (21) permits the indicating of the time when the alarm must sound. Actuating push button (22) is to leave the alarm activated, while actuating on push button (23) is to eliminate the sound of the alarm, as is shown in figure 1. The cited switches may be push-button, sliding or any other type.

Now then, according to a preferred embodiment of the invention a switch (19') that aside from being provided with above mentioned push buttons (20), (21), (22) and (23), includes a new push button (24) in functional association with the random number generating block (11) and with the hours and minutes comparator block (12), in such a way that when activation of the alarm starts, generator (11) simultaneously generates a random number that will appear on digits (15) and (15') corresponding to the hour of the alarm clock, while digits (16) and (16') will indicate "0", is included. The operations must be carried out on the basis of which digits (16) and (16') are made to coincide with digits (15) and (15') generated as random ones by block (11).

In order to make that pair of digits coincide, it will be necessary that the person has the alarm clock in front of him, for which purpose he will logically have to turn on the light and then actuating on push button (18) until the first digit of minutes (16) coincides with the first digit of hours (15). Then he must actuate on push button (17) until the second digit of minutes (16') coincides with the second digit of hours (15'), in such a way that once this

coincidence between the pairs of digits (15-15') and (16-16') is achieved, the alarm clock will remain in condition to turn off its alarm, by means of actuating on the corresponding push button (23).

Claims

1. Improved alarm clock, which comprises:

   clock means, including time counting means (3, 4, 5) and means to modify said count;
   time display means, including means to display two digits indicating the hour (15, 15') and two digits indicating the minutes (16, 16'), to display the hour and minutes in accordance with the count of the clock means;
   alarm means, including means to make the alarm go off when the clock means indicate a specific time (6, 7), means to preset the time at which the alarm must go off and means to give off an alarm sound when the alarm goes off;
   characterized in that
   it also includes:
   means to generate a first number (11), this number being a random number;
   means to display the random number when the alarm goes off;
   means to display a second number;
   means to manually modify said second number and/or said first number;
   means to allow the alarm sound to be stopped when a predetermined ratio between the first and the second numbers is displayed.

2. Alarm clock according to claim 1, wherein the alarm sound can be stopped when the displayed second and the first numbers coincide.

3. Alarm clock according to claim 1, wherein the means to display the first number are functionally associated to the two digits indicating the hour (15, 15'), in such a way that said digits indicate the first number, while the means to display the second number are functionally associated to the digits indicating the minutes (16, 16') in such a way that said digits indicate the second number.

4. Alarm clock according to claim 3, wherein the first random number is a number from 25 to 99.

5. Alarm clock according to claim 4, wherein the second number is initially "00".

6. Alarm clock according to any of the above claims, that comprises:

   a screen (14) to display the digits;
   a general switch (19') with push buttons (17, 18, 20-24) to permit at least the following operations to be carried out manually: modify the count of the clock means; preset a time at which the alarm must go off; modify the first number and/or the second number; turn off the alarm when the first and the second numbers coincide on the screen.

7. Alarm clock according to claim 1, that includes a push button (24) that makes it possible to choose between a normal operating mode wherein it is not necessary to change the displayed numbers in order to be able to turn off the alarm, and a special operating mode wherein the first random number and the second number are displayed, it being necessary to change at least one of said numbers in order to be able to stop the alarm from sounding.

Amended claims under Art. 19.1 PCT

[Received by the International Office on 4 August 1997 (04.08.97); claims 1 and 3 have been replaced by claim 1; claims 2 and 4-7 have not changed but they have been renumbered 2-6 (2 pages)]

1. Improved alarm clock, which comprises:

   clock means, including time counting means (3, 4, 5) and means to modify said count;
   time display means, including means to display two digits indicating the hour (15, 15') and two digits indicating the minutes (16, 16'), to display the hour and minutes in accordance with the count of the clock means;
   alarm means, including means to make the alarm go off when the clock means indicate a certain time (6, 7), means to preset the time at which the alarm must go off, and means to give off an alarm sound when the alarm goes off;
   means to generate a first number (11), this number being a random number;
   means to display the random number when the alarm goes off;
   characterized in that
   it also includes:
   means to display a second number;
   means to manually modify said second number and/or said first number;
   means to allow the alarm sound to be stopped when a predetermined ratio between the first and the second numbers is displayed;
   the means to display the first number being functionally associated to the two digits indicating the hour (15, 15'), in such a way that said digits indicate the first number, while the means to display the second number are functionally associated to the digits indicating the minutes (16, 16'), in such a way that said digits indicate

the second number.

2. Alarm clock according to claim 1, wherein the alarm sound can be stopped when the displayed second and the first numbers coincide.
3. Alarm clock according to claim 1, wherein the fist random number is a number from 25 to 99.
4. Alarm clock according to claim 3, wherein the second number is initially "00".
5. Alarm clock according to any of the above claims, that comprises:

a screen (14) to display the digits;
a general switch (19') with push buttons (17, 18, 20-24) to permit at least the following operations to be carried out manually: modify the count of the clock means; preset a time at which the alarm must go off; modify the first number and/or the second number; turn off the alarm when the first and the second numbers coincide on the screen.

6. Alarm clock according to claim 1, that includes a push button (24) that makes it possible to choose between a normal operating mode wherein it is not necessary to change the displayed numbers in order to be able to turn off the alarm, and a special operating mode wherein the first random number and the second number are displayed, it being necessary to change at least one of said numbers in order to be able to stop the alarm from sounding.

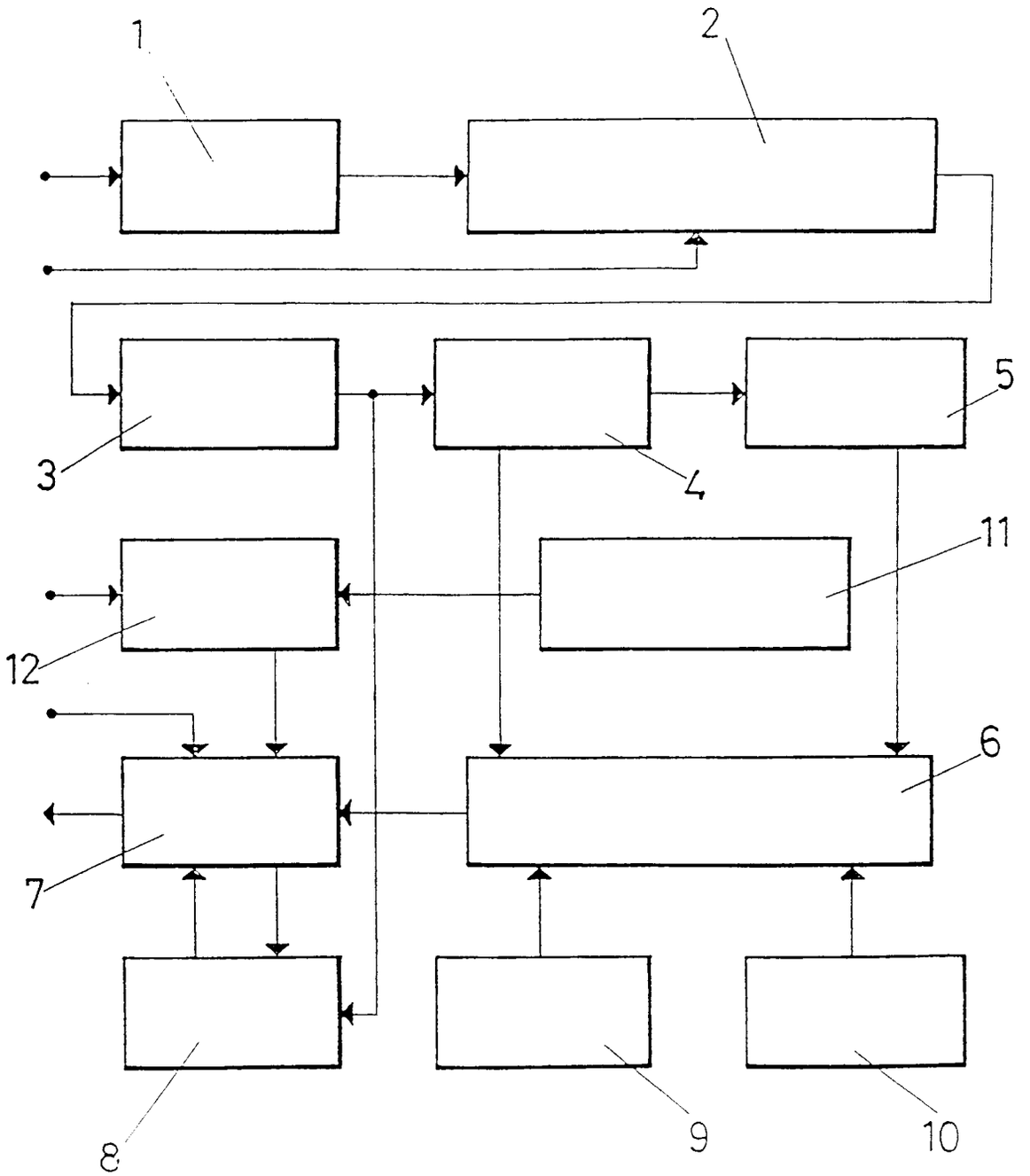

FIG.1

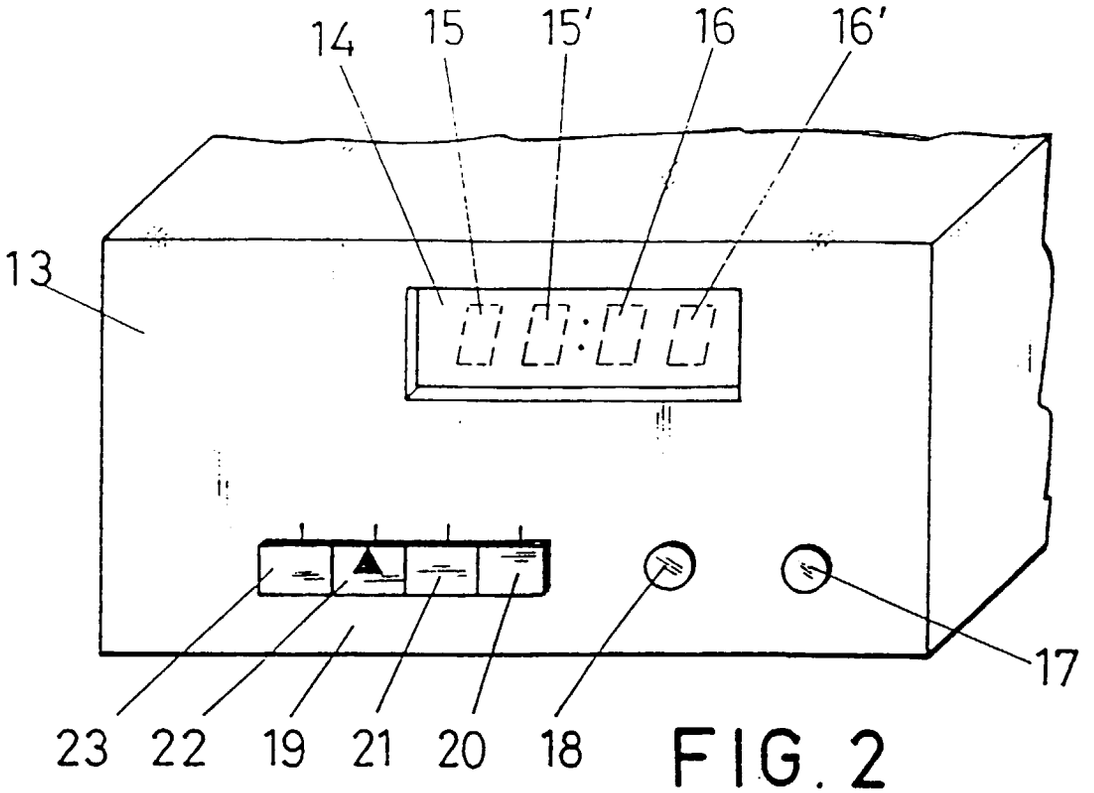
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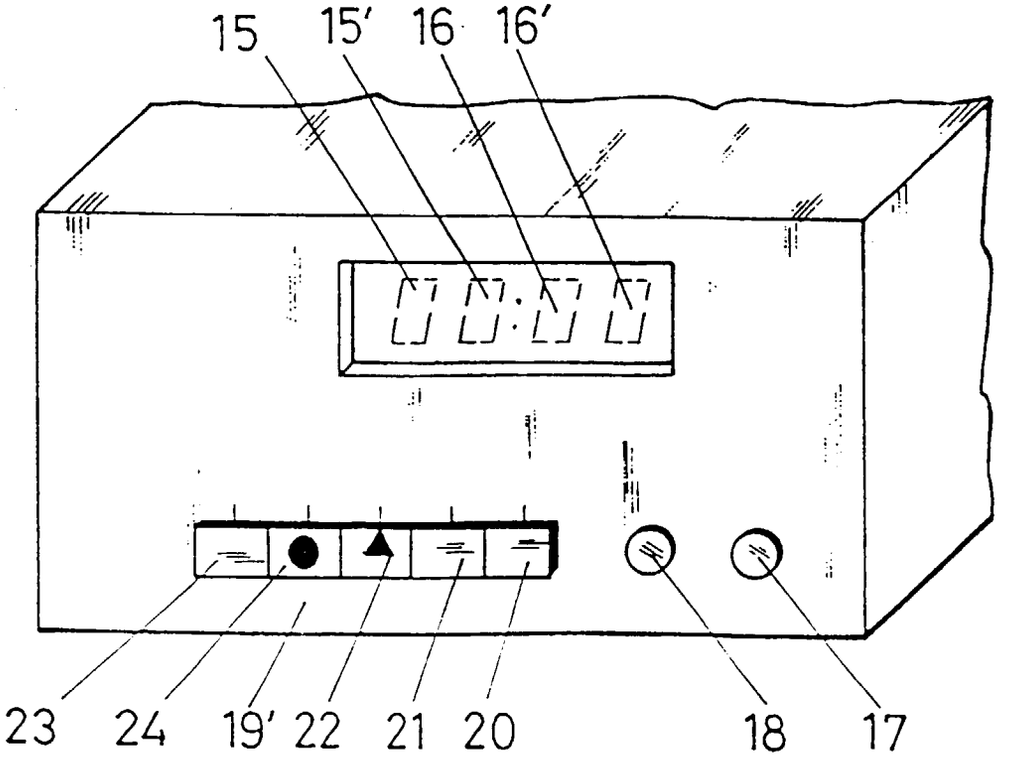
FIG. 2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19'
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17

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 97/ 00044

A. CLASSIFICATION OF SUBJECT MATTER

IPC6 G 04 G 13/02
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)

IPC6 : G 04 G

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)

WPIL, EPODOC, PAJ, CIBEPAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, 4 430 006, A (JETTER) 7 February (07.02.84) *Column 3, line 33 - column 4, line 20; figure 1*	1-7
Y	PATENT ABSTRACTS OF JAPAN, CD-ROM, PAJ G 04 1976-1993 (1/1) 61 JP, 61288194, A (NAOYUKI) 18 December 1986 (18.12.86)	1-7
Y	US, 5 189 648, A (COOPER ET AL) 23 February 1993 (23.02.93) *Column 1, line 5 - line 10; column 1, line 39 - column 2, line 14; column 2, line 30 - line 47; figure 1*	1-7
Y	US, 5 079 726, A (KELLER) 7 June 1992 (07.06.92) *column 2, line 38 - line 65; figure 1,2	1-7
A	GB, 2 205 180 (CHANG KYU) 30 November 1988 (30.11.88) *Abstract; figure 1*	1-7

[X] Further documents are listed in the continuation of Box C. [X] 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
"E" earlier document but published on or after the international filing date
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"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
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 May 1997 (28.05.97)	6 June 1997(06.06.97)
Name and mailing address of the ISA/ S.P.T.O. Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)