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(71) Applicant: **NICE S.P.A.**
31046 Oderzo (TV) (IT)

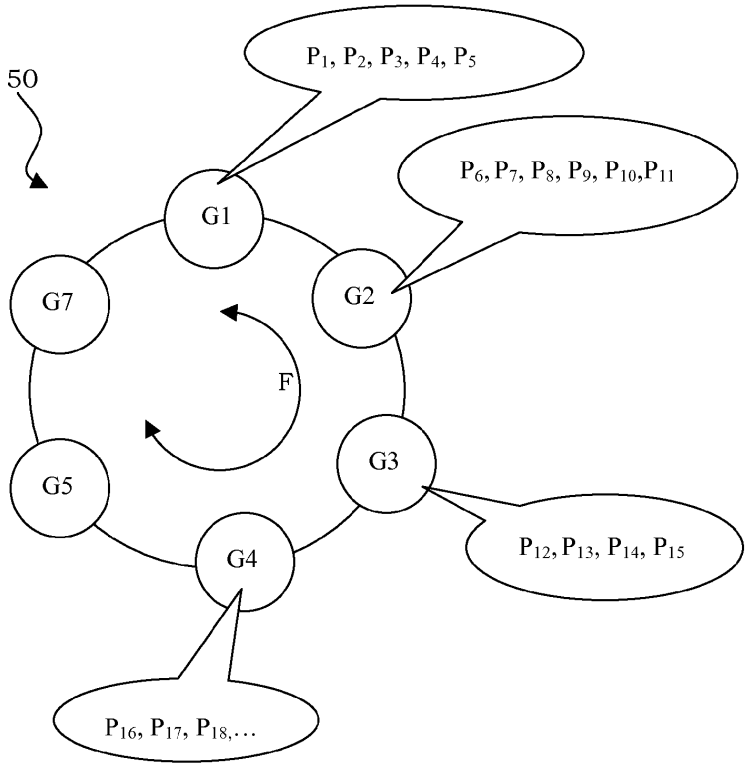
(72) Inventor: **Codognotto, Alberto**
31046 ODERZO (TV) (IT)

(74) Representative: **Citron, Massimiliano**
Via Primo Maggio, 6
31020 San Fior (TV) (IT)

(54) **Programming method**

(57) To simplify the programming of operating parameters (P_1, ..., P_n) contained in a memory (M) of an operator (30) destined to move a movable barrier, a device is proposed adapted to program or select the parameters. It comprisese means (14, 16, 18) for selecting and/or changing one or more of said parameters, and it is characterized in that the operating parameters are partitioned into two or more groups (G_1, ..., G_M) and each group is accessible to select at least one of the parameters belonging to it.

Fig. 3



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Description

[0001] The invention relates to a programming method, and to the means/device for implementing it, for a (e.g. home) operator, in general of a movable barrier such as e.g. gates, gate-doors, road barriers, shutters or blinds. We will refer as an example to a shutter.

[0002] Automations are known for roller shutters (see fig. 1 or those e.g. in EP2134918 or EP1819949) formed by an operator 30 and a remote control 10. The operator 30 includes a tubular motor 36 connected to a head 34 in which an electronic board is present that controls the motor 36 and keeps stored in a memory M a set I of n operating parameters P_1, ..., P_n of the operator 30, such as e.g. end-of-travel positions, intervention thresholds, etc. Often these operating parameters may globally be several dozens.

[0003] Typically the remote control 10 comprises three keys 14, 16, 18, respectively for controlling the ascent, the stop and the descent of the shutter. One or more secondary keys can possibly be provided for programming or for controlling additional and secondary functions. The activation or beginning of the programming procedure of the operating parameters can be obtained by pressing one or more of the secondary keys. The remote control 10 and the operator 30 communicate bidirectionally via radio antennas 12, 32.

[0004] The remote control 10 is normally used to control the movements of the shutter, or, during the installation phase and as an alternative to a specific programmer, as a programmer device for the parameters P_1, ..., P_n (see fig. 2). Each parameter P_1, ..., P_n is accessed individually only after pressing a precise combination of one or more of the keys 14, 16, 18. Each combination or sequence seq_1, ..., seq_n of keys (e.g. the key sequence [14, 14, 18, 16, 18]) is different, and uniquely identifies each of the parameters P_1, ..., P_n. The operating parameters can be numerous while the number of available keys is usually limited. Therefore, in combinations or sequences of programming keys, the variable of key pressure time has been introduced to differentiate the sequences.

[0005] Also, the remote control 10 has not a display, and the feedback to the user is given by brief movements of the motor 36.

[0006] As an example of key sequence we mention a few, in order to highlight their complexity. The brackets indicate the pressure of the keys within them, simultaneously if there is a "+":

- (key 16 + key 18) to begin the storing procedure of the lower end-level, then movement of the operator in the desired position, then (key 18) to confirm and store;
- (key 16 + key 14) to begin the storing procedure for the upper end-level, movement of the operator in the desired position, (key 14) to confirm and store;
- (key 14 + key 18) to begin the storing procedure of the intermediate or comfort end-level, move the operator in the desired position, (key 16) to confirm and store;
- (key 16 + key 18) for at least 5 seconds to start the storing procedure of wind level, then selection step by step of the wind level by (key 18), (key 16 + key 18) to confirm and store.

[0007] It is obvious that the known programming method is complex.

[0008] The problems of this system are several:

- the selection and/or parameter variation procedure is long and laborious, especially because the sequences are very long (available keys are few and the parameters P_1, ..., P_n numerous);
- if an error occurs during the sequence of keys (wrong button or wrong pressure time) the wrong parameter ends up programmed and/or the programming fails, with the result that the sequence needs to be repeated after waiting some time;
- a detailed manual showing all sequences (sometimes a lot) is needed;
- being the sequences necessarily all different from each other, the same importance is given to each parameter P_1, ..., P_n while a part of them either may not be of interest for the end user and/or installer, or may be more frequently used than the rest.

[0009] Solving some of these problems is just the object of the device and/or method defined in the claims.

[0010] The above-described operating parameters are programmable and selectable by means of a device or method or program which, to speed up and simplify the access, organizes the parameters and/or presents them by partitioning them into two or more groups. Access means let each group to be accessible to the user in order to select at least one of the parameters that belongs to the selected group. The subdivision of the parameters into groups allows (i) skipping many of them by passing from one group to another and/or (ii) shortening the parameter selection sequences and/or (iii) using a necessary smaller number of keys.

[0011] Each group can contain, to select them or access them, (i) only a set of isolated parameters, (ii) only two or more groups in their turn containing parameters, or isolated parameters and subgroups. This makes it easier to create structures such as trees with various depth levels for the parameters.

[0012] Groups can be accessed sequentially, preferably as an ordered sequence that can be run though (i.e. explored) back and forth, that is accessing or selecting a group that follows or precedes in the preestablished order. Or the sequence can be run through only in one direction, to better direct the user's choices.

[0013] The device may advantageously comprise an element operable by a user, preferably dedicated only to

this function, which is configured to

- select a group of the sequence, and/or
- determine the access and/or return to a pre-defined group of the sequence or to the selected one, and/or
- explore each group of the sequence and/or the operating parameters contained therein in an orderly way or by random access. To this aim a transition is performed between one group to another of the sequence, preferably by a step of one group at a time (that is, one can switch from a group to the one that in the sequence directly follows it or precedes).

[0014] A repeated action on or of the operable element can advantageously determine the change or selection of the group which is desired to be accessed or selected.

[0015] Each element operable by the user described above can be carried out in many ways, and preferably as

- one or more keys, and/or
- a touch-screen, and/or
- a touch or motion sensor, e.g. adapted to move a pointer on a display and /or;
- a voice detector.

[0016] Groups and/or parameters contained therein can be available and/or organized for the user in many ways, and preferably

- in pre-defined groups stored in the device, and/or
- in user-programmable groups and storable in a memory of the device (the user can program the number, order, and content of one or more groups, even all of them), and/or
- by a sequence of predefined groups stored in the remote control, and /or
- by a sequence of user-programmable groups storable in a memory of the device (the user can program the access order to groups in the sequence and/or the order of presentation) and/or;
- displayed in menu and/or via icons or alphanumeric characters on a display.

[0017] Another advantage of the invention is that within two or more different groups it is possible to use sequences equal to each other, which however operate/regulate different parameters. In this way it is possible to decrease the number and/or the length of the sequences.

[0018] The invention also contemplates a programming method (e.g. through the above-mentioned device) of the above-mentioned operating parameters. The operating parameters are partitioned into two or more groups so that a group can be selected to change at least one parameter belonging to it. Each functional variant described for the device is contemplated as a possible phase of the method, and for brevity's sake is not repeated.

[0019] Both the device and the method may include other variants, defined here:

- the groups are sorted according to priority or frequency of use and utility, that is, groups are automatically sorted as a sequence presented to the user by placing at the beginning the groups which statistically have been accessed more or which reasonably will be chosen first in the future; and/or
- the first group in the sequence contains the parameters essential to the operation, e.g. the end-of-travel positions and for storing/ inserting a new remote control; and/or
- the second group of the sequence contains the operation parameters of the operator, such as the thresholds for sun, wind, rain, torque reduction, force, etc.;
- the third group of the sequence contains special parameters dedicated to (and/or characteristic of) the specific movable barrier (box curtains, blinds, etc.); and/or
- the fifth group of the sequence contains the deletion functions of the parameters in memory; and/or
- special operations performable on parameters (also present in other groups) are concentrated in a little accessible group (preferably the last in the sequence) or in a group hidden or "far" from the group of initial access. E.g. a special function is the cancellation of a parameter previously stored as e.g. the intermediate level, the end-of-travel positions, etc. Generally, on the parameters of the group functions can be executable that are different from those activated by accessing the same parameters of other groups. This prevents unauthorized and accidental access of the critical area of deletion or inhibition by unauthorized persons or unable to work properly.

[0020] Preferably the programming method is implemented by a software program, e.g. present or loaded into RAM or ROM of a microprocessor arranged inside the device.

[0021] Advantageously, the inventive concept is applicable to carry out a device in the form of a remote control.

[0022] The advantages of the invention will be made still clearer by the following description of a preferred embodiment, with reference to the accompanying drawing in which

Fig 1 shows a known operator system,
Fig 2 shows a known selection method of parameters in the operator of Fig 1,
Fig 3 shows a selection method of parameters for an operator,
Fig 4 shows a remote control.

[0023] A system according to the invention envisages the same architecture of Fig. 1 and 2, thus it will not be repeated. The logical structure changes to organize the access and selection of the operating parameters P_1, ...,

P_n, shown in Fig. 3.

[0024] The operating parameters P_1, ..., P_n are preferably the same of the prior art (Fig. 1 and 2). The set I of n operating parameters P_1, ..., P_n is partitioned into M groups or subsets G_1, ..., G_M so that each group G_1, ..., G_M contains a number of such parameters. Repetitions of parameters are also possible in some groups, if necessary.

[0025] By way of example one can subdivide the operating parameters into the following groups:

- group G_1 - parameters related to the upper, lower and intermediate end-of-travel position;
- group G_2 - parameters related to the sensitivity of the motor to obstacles;
- group G_3 - sun-level related parameters;
- group G_4 - wind-level and wind-direction related parameters;
- group G_5 - parameters related to the level and direction of rain;
- group G_6 - parameters related to new remote controls;
- group G_7 - parameters related to the automatic opening or closing during the day.

[0026] The groups G_1, ..., G_M form an ordered sequence 50 that the user can run through, see arrow F in Fig. 3, using a remote control 90 (as we will explain below). Fig. 3 shows an example for M = 7, and next to some groups G_1, ..., G_M the parameters contained therein.

[0027] By browsing the sequence 50 and moving from one group to another, the user can quickly reach the group containing the parameters of interest, because he skips a lot of them in one shot. In addition, each group may be specialized, as previously described, to contain only parameters of a certain type, thereby improving the order and the logic of the system.

[0028] The navigating direction of the sequence 50 (i.e. the sequential access to the groups G_1, ..., G_M) can be bi-directional or unidirectional (in the drawing of Fig. 3, clockwise and counterclockwise), and/or the sequence 50 may be circular, i.e. one can pass from the group G_7 (or in general the last in the sequence) to group G_1 (or in general the first of the sequence, here defined *initial group*) or vice versa.

[0029] When the group on which to operate is chosen, the user has access to its parameters and can select one, e.g. with a combination of keys, which, however, is much shorter than the prior art, or by scrolling a menu that presents all the parameters of group. To act on another parameter, the user and/or installer just needs to change group, with no downtime.

[0030] According to the type of logical structure to be implemented, the remote control 90 may have different configurations.

[0031] It is preferred e.g. to create a hierarchy between the groups G_1, ..., G_M, and then make the sequence unidirectional and not circular. Even if it seemingly eliminates the flexibility of the sequence 50, the presentation to the user and/or installer is better organized and the user already has an established programming or browsing path, for example with the parameters of greater use in the first groups that he meets at the beginning of the sequence.

[0032] In fact, the partition described above envisages in the initial group G_1 the parameters for the end-of-travel positions, which are indispensable for any automation and absolutely must be programmed. Thus, especially the average time spent on programming the most common parameters is reduced.

[0033] In the remote control 90 there are provided means for running through the sequence 50 in one direction only, passing from the initial group G_1 of the sequence to the next (i.e. with a step-by-step sequence: $G_1 \rightarrow G_2 \rightarrow G_3 \rightarrow G_4 \rightarrow G_5$...). The initial group, which is met upon starting the programming of the parameters, preferably remains always the same, as a system setting. In particular the means for running through may comprise:

- a key 80, advantageously placed in a position not easily accessible during ordinary use of the remote control and/or hidden, that allows to jump from one group to another group with a step of a group at a time, and/or
- a small wheel, and/or
- a potentiometer, and/or

a capacitive sensor.

[0034] The remote control 90, such as that numbered with 10 shown in Fig. 1, generally exhibits three keys 94, 96, 98, respectively for controlling the ascent, the stop and the descent of the shutter.

[0035] With these the operating parameters within each group can also be selected, without having to implement and use different sequences to select each parameter. A simple way is to show e.g. on a display a menu with all the parameters of the group.

[0036] In order to facilitate a return to the initial group of the sequence 50 and/or as exit procedure in case of error, it is preferably provided a reset means, e.g. a key 82, which has a concealed and/or hardly-reachable location too. By touching it, one can e.g. return to the initial group or unselect the current parameter. The reset key can be replaced by or combined with the expiration of a predetermined time.

Claims

1. Device (90) adapted to program or select operating parameters (P_1, ..., P_n) contained in a memory (M) of an operator (30) destined to move a movable barrier, the device comprising means (14, 16, 18) for

selecting and/or changing one or more of said parameters,
characterized in that the operating parameters are partitioned into two or more groups (G_1, ..., G_M) and each group is accessible to select at least one of the parameters belonging to it.

2. Device according to claim 1, wherein the groups are accessible in sequence.

3. Device according to claim 2, wherein the sequence can be run-through back and forth (F).

3. Device according to claim 2, wherein the sequence can be run-through only in one direction.

4. Device according to claim 2 or 3, comprising an element operable by a user adapted to select a group of the sequence.

5. Device according to claim 2 or 3 or 4, comprising an element operable by a user adapted to determine the access and/or the return to a predefined group in the sequence.

6. Device according to claim 2 or 3 or 4 or 5, comprising an element operable by a user adapted to explore sequentially or by random access each group of the sequence.

7. Device according to claim 6, wherein the element adapted to explore is capable of performing a transition, between one group of the sequence to another, one group at a time.

8. Device according to claim 6 or 7, wherein the element operable by a user comprises one or more keys; and/or a touch screen; and/or a touch or motion sensor; and/or a voice detector.

9. Device according to one of the preceding claims, wherein the groups are predefined and stored in a memory of the device.

10. Device according to one of the preceding claims, wherein the groups are ordered as a sequence shown to the user by placing at the beginning the groups which statistically have been accessed more.

11. Device according to one of the preceding claims, **characterized by** being a remote control.

12. Programming method, through a device (90), of operating parameters (P_1, ..., P_n) contained in a memory (M) of an operator (30) destined to move a movable barrier, **characterized by** partitioning the operating parameters in two or more groups so that a group can be selected to change at least one parameter belonging to it.

13. Program able to implement the method of claim 12 when executed by an electronic computing device.

Fig. 1 (Prior Art)

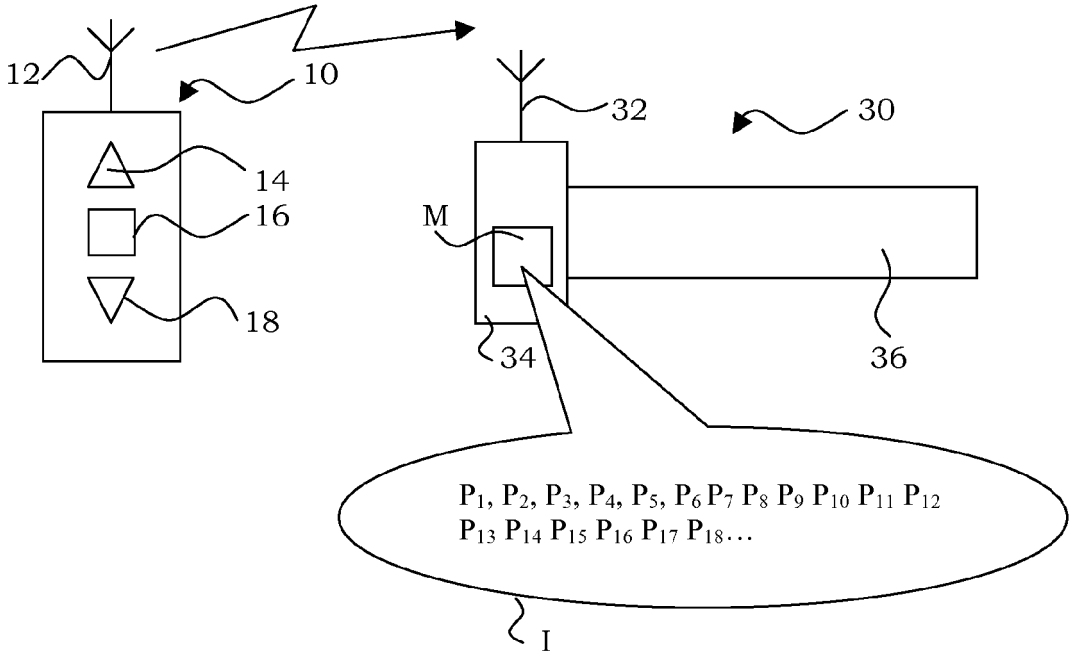


Fig. 2 (Prior Art)

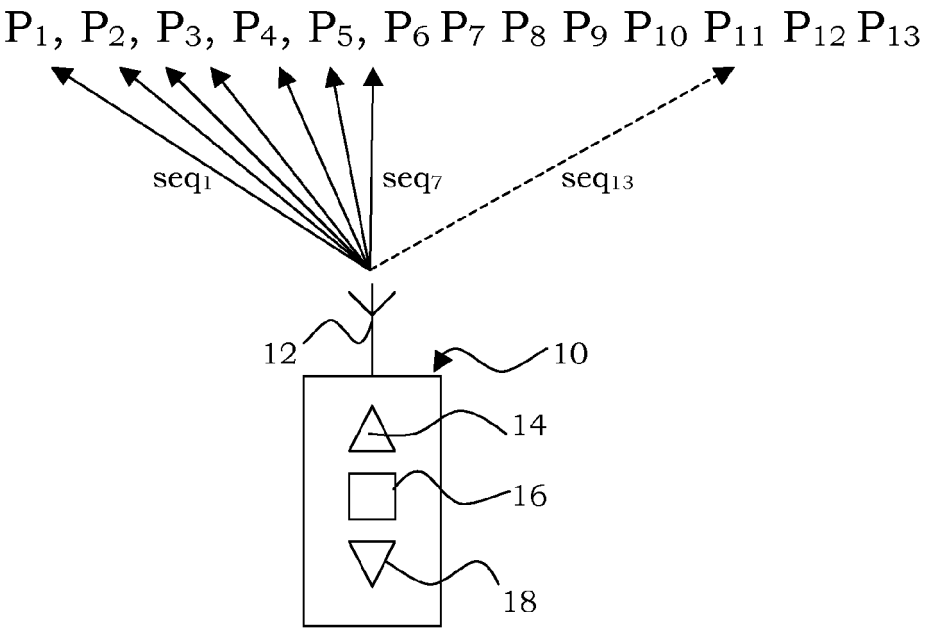


Fig. 3

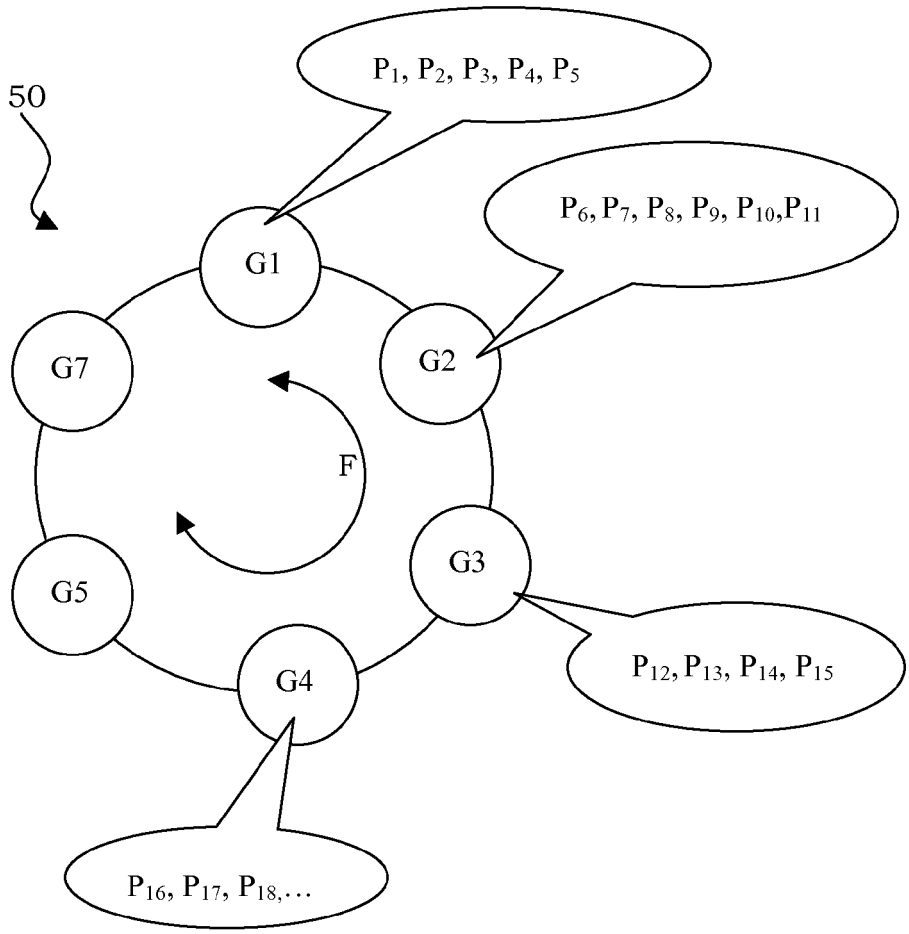
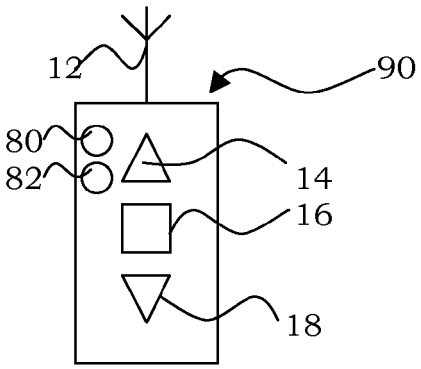

50
P1, P2, P3, P4, P5
P6, P7, P8, P9, P10,P11
G1
G2
G3
G4
G5
G7
F
P12, P13, P14, P15
P16, P17, P18,…

Fig. 4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EUROPEAN SEARCH REPORT

Application Number
EP 13 15 1422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 859 298 A2 (PRETTL ROLF [DE]) 19 August 1998 (1998-08-19) * column 7, lines 15-22 * * column 9, lines 5-41 * * figures 1,2 *	1-10	INV. E05F15/16 G05B19/42
A,D	WO 2008/122922 A1 (NICE SPA) 16 October 2008 (2008-10-16) * the whole document *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

E05F
G05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 March 2013	Klemke, Beate

CATEGORY OF CITED DOCUMENTS

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04-03-2013

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

REFERENCES CITED IN THE DESCRIPTION

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- EP 1819949 A **[0002]**