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(71) Applicant (for all designated States except US): **AGCO GMBH** [DE/DE]; Johann-Georg-Fendt Strasse 4, 87616 Marktoberdorf (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DOBLER, Johann** [DE/DE]; Hauptstr. 60, 87764 Legau (DE). **HACKFORT, Adrian** [DE/DE]; Greifenberger Strasse 8a, 82279 Eching am Ammersee (DE). **KEMMLER, Elmar** [DE/DE]; Turkheimer Str. 20, 87600 Kaufbeuren (DE). **KREIL, Oliver** [DE/DE]; Sonnenstrasse 10, 87662 Kaltental (DE). **SCHREIBER, Matthias** [DE/DE]; Kemptener Str 22, 87647 Unterthingau (DE).

(74) Agent: **MORRALL, Roger**; AGCO Limited, Abbey Park Stoneleigh, Kenilworth Warwickshire CV8 2TQ (GB).

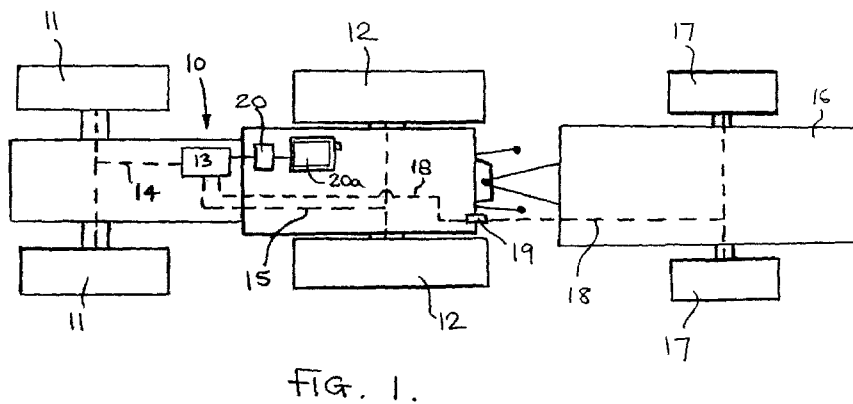
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Published:

— with international search report (Art. 21(3))

(54) Title: TYRE INFLATION SYSTEM FOR A TRACTOR



(57) Abstract: A tyre inflation control system for a tractor (10) has an inflation means (13) for inflating and deflating tyres (11, 12) of the tractor. Conduits (14,15) connect the inflation means (13) with the tyres, and a control means (20) connected with the inflation means is provided for storing predetermined tyre pressure levels and initiating the changing of the inflation pressure of the tyres between the predetermined pressure levels set in the control means. The predetermined tyre pressure levels can conveniently correspond to a field work pressure level and a road work pressure level and the control means can store inflation pressures for the tyres of both the tractor (10) and any associated trailer (16) or machine being towed by the tractor. The control means may include an electronic display monitor (20a) with a touch sensitive screen through which the predetermined levels of tyre pressure can be entered.

## TYRE INFLATION SYSTEM FOR A TRACTOR

This invention relates to a tractor tyre inflation system.

Tractors are required to carry out a variety of jobs operating in either fields or on harder surfaces such as roads or farm yards. This requires the tractor tyres to be operated at different pressures (e.g. 0.8 bar when in the field and 1.8 bar when on the road) for ecological (reduction of ground compaction in the field), efficient (tyre durability and lower roll resistance=improved fuel consumption) and safe (avoiding low tyre pressure at high speeds) operation.

It is an object of the present invention to provide an improved and more convenient form of tyre inflation system for use on a tractor.

Thus according to the present invention there is provided a tyre inflation control system for a tractor comprising an inflation means for inflating and deflating tyres of the tractor, conduit means connecting the inflation means with the tyres, and a control means connected with the inflation means for storing predetermined tyre pressure levels and initiating the changing of the inflation pressure of the tyres between the predetermined pressure levels set in the control means.

Conveniently the predetermined tyre pressure levels correspond to a field work pressure level and a road work pressure level.

The tractor driver may operate a control member to initiate changing of the tyre pressure between the predetermined levels.

The control means may store inflation pressures for the tyres of both the tractor and any associated trailer or machine being towed by the tractor.

The control system may include a means to communicate with any associated trailer or machine towed by the tractor via ISOBUS according ISO 11783 or other standardized communication bus systems.

The control system may include a second control means for controlling the inflation pressure of tyres on any associated trailer or machine towed by the tractor.

The control means may include an electronic display monitor with a touch sensitive screen through which the predetermined levels of tyre pressure can be entered.

Alternatively, the predetermined tyre pressures for the trailer may be separately entered into the second control means, the second control means being connected with the other control means so that operation of the driver operated control member initiates changes in both the tractor and trailer tyre pressures.

Predetermined pressures entered in the display monitor may be communicated to the trailer mounted second control means and information regarding the trailer pressures may be communicated to the monitor independently of the other control means.

Conveniently touch sensitive areas may be provided for the entering and display of predetermined pressures for the front tyres of the tractor and for the rear tyres of the tractor.

Additional touch sensitive areas may be provided for the entering and display of predetermined pressures for the tyres of a trailer or machine being towed by the tractor.

The additional touch sensitive areas for entering and displaying the predetermined pressure of the trailer or towed machine tyres may be invoked by the operation of a switch to indicate the connection to the tractor of a trailer or towed machine.

The touch sensitive areas for the entering and display of the tyre pressures are preferably grouped together in pairs corresponding to desired road and field pressures for the tyres, and operation of the driver control member switches between the predetermined road and field pressures for the tyres.

The display monitor may also have display areas in which the current actual values of the tractor/trailer tyre pressures are displayed on operation of a test button.

The display monitor may also have display areas in which the driver is warned if the tractor is exceeding a certain vehicle condition (e.g. vehicle speed) while a field work pressure level is still activated which is not suitable for this higher speed.

The display monitor may also have display areas in which the driver is warned if the tractor is falling below a certain vehicle condition (e.g. vehicle speed) while a road work pressure level is still activated which is not suitable for operation in field.

The warning may include the possibility to automatically switch to the appropriate tyre pressure condition.

The driver operated control member for changing between the predetermined pressures may be a virtual toggle switch on the monitor screen.

The switch to invoke the additional touch sensitive areas for entering and displaying the tyre pressures of the trailer or towed machine may be a second virtual toggle switch on the monitor screen.

The test button to display the current actual values of the tractor/trailer tyre pressures may be a virtual button on the monitor screen.

The control system of the present invention may be incorporated in a multi-function tractor performance monitoring and display system which can be used to display and enter a range of tractor operating parameters, the system including a display monitor at least part of which can be set to display and input the predetermined levels of tyre pressure of the control system when a tyre pressure control mode of the multi-function system is selected.

The present invention will now be described with reference to the accompanying drawings in which:-

Figure 1 shows diagrammatically a tractor fitted with a tyre inflation system in accordance with the present invention;

Figure 2 shows a screen layout of an electronic display monitor which forms part of a control means for the inflation system of Figure 1 when the tractor is not towing a trailer;

Figure 3 shows a screen layout of the electronic display monitor when the tractor is towing a trailer;

Figure 4 shows a pop-up window of the electronic display monitor showing deviation from the set tyre pressure;

Figure 5 shows a pop-up window of the electronic display monitor showing operation of the tractor at too high a speed for the current tyre pressures:

Figure 6 shows a plan view of a display monitor used to display the screen layouts of 2 to 5, and

Figure 7 is an end view of the display monitor shown in Figure 6.

Referring to the drawings, a tractor 10 has front tyres 11 and rear tyres 12 which are connected with an inflation means 13 via air conduits 14 and 15 respectively. Additionally a trailer 16 is connected to the tractor and has tyres 17 which are connected with the inflation means 13 via conduit 18 and a connector 19 provided on the rear of the tractor.

The inflation means 13 includes one or more air compressors and associated air reservoirs as, for example, described in the applicant's co-pending UK patent application No.0911309.3. The precise nature of the inflation means does not form part of the present invention and any form of inflation means can be used which is capable of changing the tyre pressures within an acceptable time period.

The inflation system also includes a control means 20 which is connected with the inflation means 13 and which is capable of storing predetermined tyre pressures entered by the tractor driver and initiating the changing of tyre pressures between the predetermined pressure levels set in the control means.

In a preferred arrangement the control means includes an electronic display monitor 20a (see Figures 6 and 7) and is part of an overall tractor performance monitoring and display system which can be used to display and enter a large range of tractor operating parameters. The monitor can be set to operate in its tyre inflation mode from a higher level screen display which offers various modes of operation to control such tractor functions as front and/or rear linkages, hydraulic valve control or cruise control settings etc. If preferred a separate monitor can be used to display and enter the tyre pressure data of the tyre inflation control system of the present invention.

In a further embodiment, the electronic display monitor 20a or a separate monitor is in communication with the trailer by using an ISOBUS according to ISO 11783. This ensures easy connectability between different tractors and trailers.

The monitor 20a has a screen unit 50 with a touch sensitive screen 50a and a control unit 51 which has a handle portion 52 and a rectangular pad of push buttons 54. In an alternative construction the control unit 51 may be detachable from the screen unit 50 and connected thereto by wires, or wirelessly. This detachable control unit can be attached to another support surface for ease of operation by the operator. For example, the control unit could be attached to an arm of a tractor cab seat. The handle portion 52 which comprises a straight, elongated central element and a shorter connecting element for connection to the screen unit 50 provides the operator with a grip to steady and support the hand of the operator whilst allowing the thumb to operate the pad of buttons 54 positioned above the handle portion 52. The monitor 20a may be mounted on an adjustable support stand (not shown) so that the screen unit 50 and control unit 51 can be tilted about substantially horizontal and vertical axes. In total there are nine buttons 54a-54f positioned on the pad 53. To the side of the pad of buttons 54 is a rotary knob 55, also operable by the operator's thumb. The buttons 54 and/or touch sensitive screen 50a are used to navigate around the terminal screen 50a which controls a large range of tractor operating parameters. The function of each of the buttons 54a to 54f is as follows:

**OK button 54a**-confirms the selected function / the performed action

**Esc button 54b**- jumps up one menu level each time it is pressed. Pressing it longer than 2 seconds takes the operator back to the top menu of the current application. This is comparable to pressing ESC several times.

**Help button 54c**- which is marked with a "?" displays help information on operating the terminal/tractor functions. It opens an Operating Manual with information of a selected function/parameter.

**Cursor arrow control buttons 54d**- these four buttons can be used as an alternative to touch screen control for navigation around the screen 50a etc. Pressing the cursor arrows moves the "focus" from one operating element on the screen to another.

**Placement button 54e** – pressing this button brings up a screen divided into four quadrants 50a(i) to 50a(iv) into which chosen application groups can be entered

**Home button 54f** - Pressing the home button displays a top level menu in the upper right quadrant 50a(i) so that a selection can be made as to a new parameter to be displayed on the monitor.

The rotary knob 55 is provided on the control unit 51 so that when the knob is turned values are set or items are selected from lists to complete fields. Turning the rotary knob 55 faster changes values proportionally faster. Pressing the rotary knob 55 axially in direction P confirms a selection. It is redundant if the OK button 54a in the centre of the cursor controls 54d is used.

Alternatively, or in addition to the pad of push buttons 54, the touch sensitive screen 50a may be used. Screen 50a has assigned areas 60a – 60h along its right hand edge and touch sensitive areas 61a – 61h along its left hand edge. These assigned touch sensitive areas can be used to select which tractor operating parameters the screen 50a is displaying. As indicated previously, screen 50a can be divided into four display quadrants 50a(i) to 50a(iv). Touch sensitive area 60a, for example, can be used to select the display of a range of tractor operating parameters, such as front power lift operating movement limits and maximum pressure, rear power lift operating movement limits and maximum pressure, front and rear hydraulic valve operating parameters and tyre pressure control, in the area 50a(i) and the area 50a(ii) of the screen.

Thus to institute the display of the tyre pressure control mode in the screen areas 50a(i) and 50a(ii) the operator either directly presses the edge area 60a or navigates to the area 60a using the cursor buttons 54d and the OK button 54a. This changes the display in areas 60a to 60h to icons indicative of operating parameters mentioned above and the operator then presses the tyre pressure control mode icon to change the display in the screen areas 50a(i) and 50a(ii) to that shown in Figures 2 and 3 of the present application.

In the tyre pressure control mode, the monitor areas 50a(i) and 50a(ii) display a tractor icon 21 with arrows 22 and 23 indicating the control of the pressures in the front and rear tyres of the tractor respectively. The screen has icons 24 and 25 which indicate display lines associated with road and field operation of the tractor respectively. Touch sensitive areas 24a and 24b are used to enter and display predetermined levels of pressure required by the driver for the front and rear tyres respectively when operating on the road. Similarly touch sensitive areas 25a and 25b are used to enter and display predetermined levels of pressure required by the driver for the front and rear tyres respectively when operating in the field.

To set the values in areas 24a, 24b, 25a and 25b the respective area is invoked by the driver tapping the area, which then becomes highlighted, and the pressure value currently entered in the area is then raised or lowered using an suitable interface such as rotary knob 55 or a numeric key pad (which can be virtual on the monitor screen or a real pad) connected with the

monitor. After setting the values, system immediately starts to readjust and display current pressure.

The monitor display also includes a first virtual toggle switch 26 which has a road use icon 26a and a field use icon 26b. With the switch in the position shown in Figure 2 the road use icon 26a is effectively depressed and the control means 20 was last operated to change the front and rear tyre pressures to the road levels set in areas 24a and 24b.

To change to the field pressure levels set in areas 25a and 25b the driver simply presses the field use icon 26b which causes the virtual icon to rock and the inflation means 13 to reduce the front and rear tyre pressures to the values currently entered in areas 25a and 25b. This therefore provides a simply manner to switch between road and field pressures.

The system also includes display areas 27a and 27b which display the current pressures in the front and rear tractor tyres respectively when a test button 28 on the screen is pressed.

There is a further virtual toggle switch 29 provided on the screen which has a trailer icon 29a. When switch 29 is in the position shown in Figure 2 (i.e. when the trailer icon 29a is not depressed) the tyre pressure system for the trailer is deactivated.

If switch 29 is depressed, as shown in Figure 3, this indicates that a trailer or other machine is connected to the tractor and trailer/machine icon 30 is displayed and additional touch sensitive areas 24c and 25c appear on the screen for the entry and display of the predetermined pressures levels of trailer tyre pressure for both road and field operation. With the rear tyres connected to the inflation means 13 via connector 19, when switch 26 is operated the pressures in the tractor tyres and the trailer tyres will change between the values set in areas 24a, 24b, 24c and 25a, 25b 25c.

If the values are set in areas 24a, 24b, 24c and 25a, 25b 25c and switch 26 is depressed to indicate road or field operation, the current pressures in the tractor and trailer tyres will be shown in display areas 27a, 27b and 27c.

Also, if button 28 is operated the current pressures in the tractor and trailer tyres will be shown in display areas 27a, 27b and 27c.

If set values 24a, 24b, 24c or 25a, 25b 25c and current pressures shown in display areas 27a, 27b and 27c diverge, a pop-up window, as shown in figure 4, is generated showing the current

pressure values in display areas 30a, 30b, 30c and the values set in areas 31a, 31b, 31c. In addition, an icon 32 (similar to icons 24 and 25) is shown indicating whether the set values are referring to predetermined levels for road use or field use as chosen by first virtual toggle switch 26. The driver is asked whether the system should correct the current pressure to the set value by confirming with switch 33a. The driver can abort correction by depressing switch 33b.

A stop switch 34 (shown in figure 2 and 3) is provided to quickly abort every action taken by the tyre pressure control system. This may be necessary if the driver recognizes malfunction or dangerous situations during adjustment of the tyre pressures.

An additional pop-up window 40 (see figure 5) warns the driver if the tractor is exceeding a certain vehicle condition (e.g. vehicle speed) while a field work tyre pressure level is still activated which is not suitable for this higher speed.

Similarly, the pop-up window 40 (see figure 5) warns the driver if the tractor is falling below a certain vehicle condition (e.g. vehicle speed) while a road work pressure level is still activated which is not suitable for operation in field.

The pop-up window 40 includes the question whether the system should correct the current pressure to the appropriate tyre pressure condition by confirming with switch 41a. The driver can abort correction by depressing switch 41b

Although the system described above only adjusts pressure after confirmation by the driver, it is envisaged that the system could include automatic adjustment of the tyre pressure if set value and current pressures diverges or an automatic switch to field use or road use settings depending on the current vehicle operating condition.

As will be appreciated, although in the above described construction the various switches 26 and 29 and the button 28 are virtual devices on the monitor screen these devices could be real switches or buttons connected with the monitor.

## CLAIMS

1. A tyre inflation control system for a tractor comprising an inflation means for inflating and deflating tyres of the tractor, conduit means connecting the inflation means with the tyres, and a control means connected with the inflation means for storing predetermined tyre pressure levels and initiating the changing of the inflation pressure of the tyres between the predetermined pressure levels set in the control means.
2. A control system according to claim 1 in which the predetermined tyre pressure levels correspond to a field work pressure level and a road work pressure level.
3. A control system according to claim 1 or 2 in which the tractor driver operates a control member to initiate changing of the tyre pressure between the predetermined levels.
4. A control system according to any one of claims 1 to 3 in which the control means stores inflation pressures for the tyres of both the tractor and any associated trailer or machine being towed by the tractor.
5. A control system according to any one of claims 1 to 3 in which a second control means is provided for controlling the inflation pressure of tyres on any associated trailer or machine towed by the tractor.
6. A control system according to claim 5 in which the predetermined tyre pressures for the trailer may be separately entered into the second control means, the second control means being connected with the other control means so that operation of the driver operated control member initiates changes in both the tractor and trailer tyre pressures.
7. A control system according to any one of claims 1 to 6 in which the control means includes an electronic display monitor with a touch sensitive screen through which the predetermined levels of tyre pressure can be entered.

8. A control system according to claim 7 in which there are touch sensitive areas for the entering and display of predetermined pressures for the front tyres of the tractor and for the rear tyres of the tractor.
9. A control system according to claim 8 in which there are additional touch sensitive areas for the entering and display of predetermined pressures for the tyres of a trailer or machine being towed by the tractor.
10. A control system according to claim 9 in which the additional touch sensitive areas for entering and displaying the predetermined pressure of the trailer or towed machine tyres are invoked by the operation of a switch to indicate the connection to the tractor of a trailer or towed machine.
11. A control system according to any one of claims 8 to 10 in which the touch sensitive areas for the entering and display of the tyre pressures are grouped together in pairs corresponding to desired road and field pressures for the tyres, and operation of the driver control member switches between the predetermined road and field pressures for the tyres.
12. A control system according to any one of claims 7 to 11 in which the display monitor also has display areas in which the current actual values of the tractor/trailer tyre pressures are displayed.
13. A control system according to any one of claims 7 to 12 in which the display monitor has display areas in which the driver is warned if the tractor is exceeding a certain vehicle condition (e.g. vehicle speed) while a field work pressure level is still activated which is not suitable for this higher speed.
14. A control system according to any one of claims 7 to 13 in which the display monitor has display areas in which the driver is warned if the tractor is falling below a certain vehicle condition (e.g. vehicle speed) while a road work pressure level is still activated which is not suitable for operation in field.
15. A control system according to claim 13 or 14 in which the control means automatically switches to the appropriate tyre pressure condition when the driver is warned.

16. A control system according to any one of claims 7 to 15 in which the driver operated control member for changing between the predetermined pressures is a virtual toggle switch on the monitor screen.
17. A control system according to claim 9 in which the switch to invoke the additional touch sensitive areas for entering and displaying the tyres pressures of the trailer or towed machine is a second virtual toggle switch on the monitor screen.
18. A control system according to claim 12 in which the current actual values of the tractor/trailer tyre pressures are displayed on operation of a virtual button on the monitor screen.
19. A control system according to any one of claims 1 to 18 incorporated in a multi-function tractor performance monitoring and display system which can be used to display and enter a range of tractor operating parameters, the system including a display monitor at least part of which can be set to display and input the predetermined levels of tyre pressure of the control system when a tyre pressure control mode of the multi-function system is selected.
20. A tyre inflation control system for a tractor constructed and arranged substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

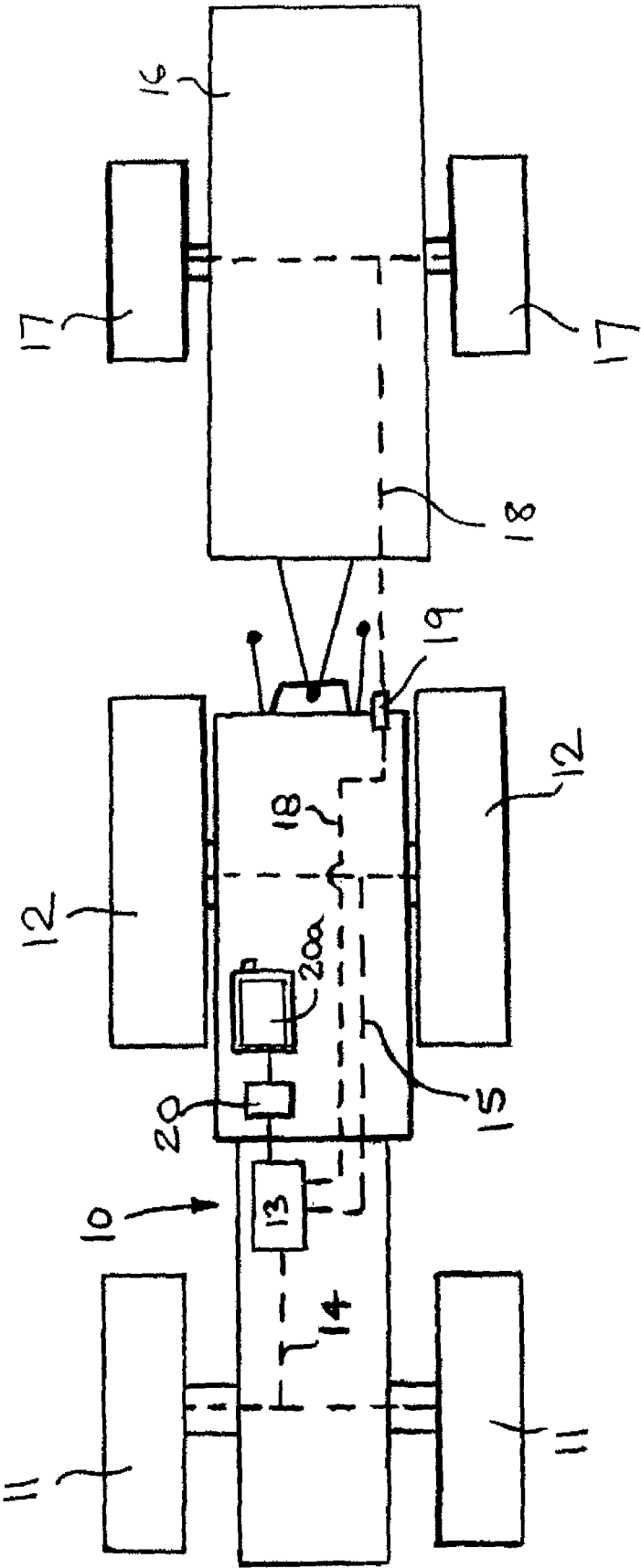
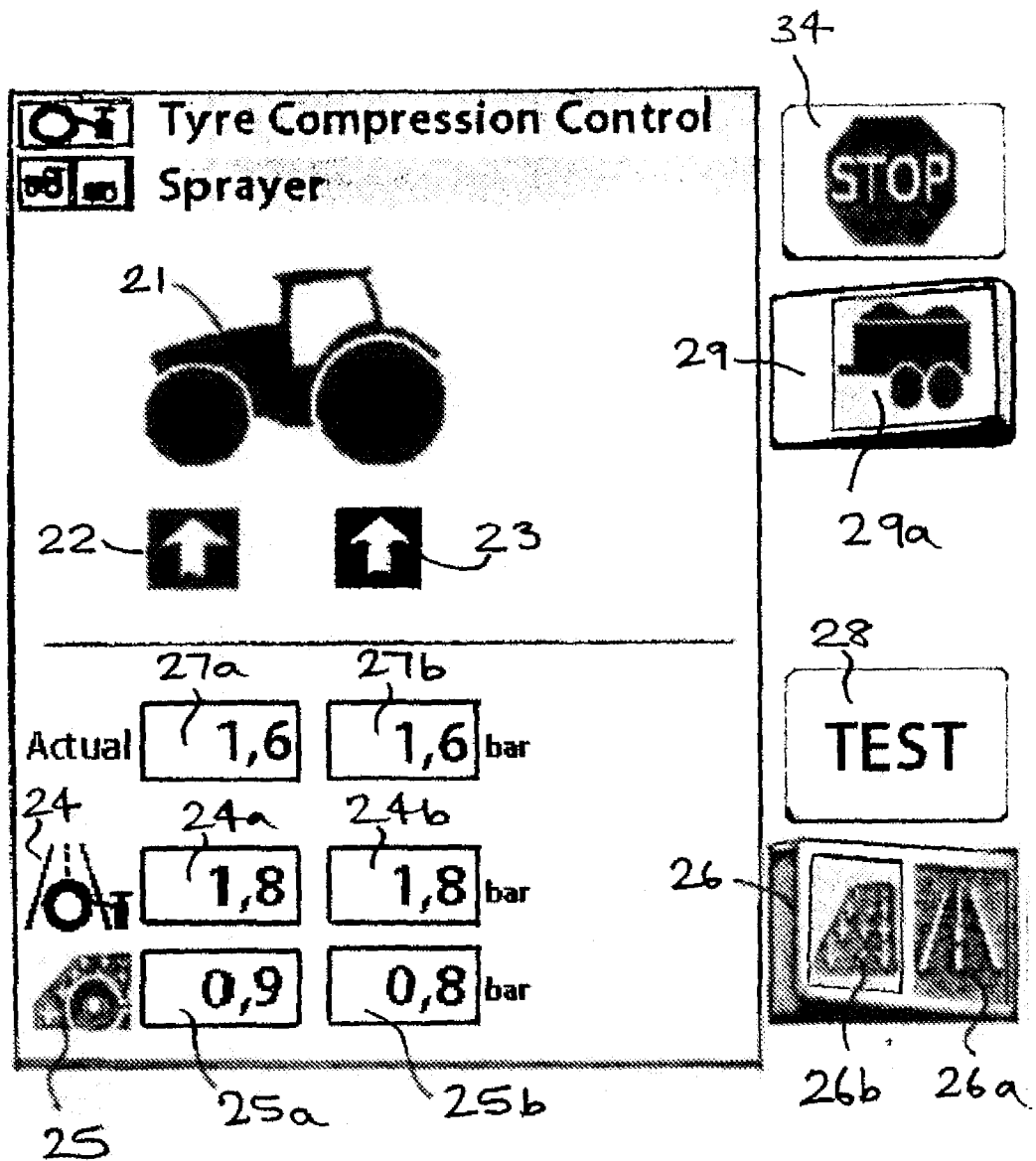


FIG. 1.

FIG. 2.

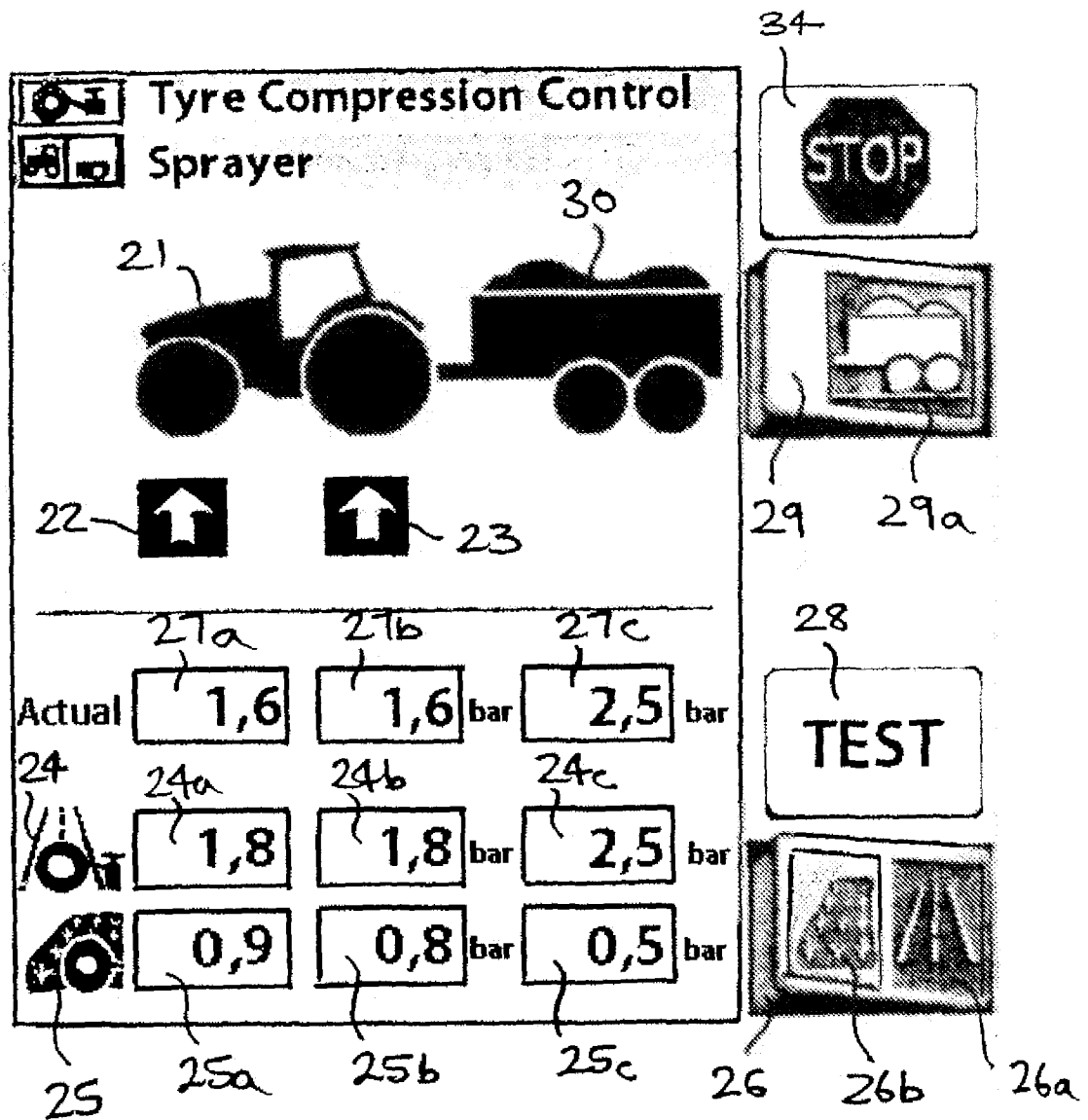


FIG. 3.

0



There is a deviation from the actual pressure to the set pressure:

|                 | 30a | 30b | 30c     |
|-----------------|-----|-----|---------|
| Actual Pressure | 1,6 | 1,6 | 2,2 bar |
| Set Pressure    | 1,8 | 1,8 | 2,5 bar |

32  31a 31b 31c

Should the pressure be corrected?



33b



33a

FIG. 4.

40



You are exceeding the vehicle speed suitable for FIELD tyre pressure setting !

Should the tyre pressure setting be switched to ROAD condition ?

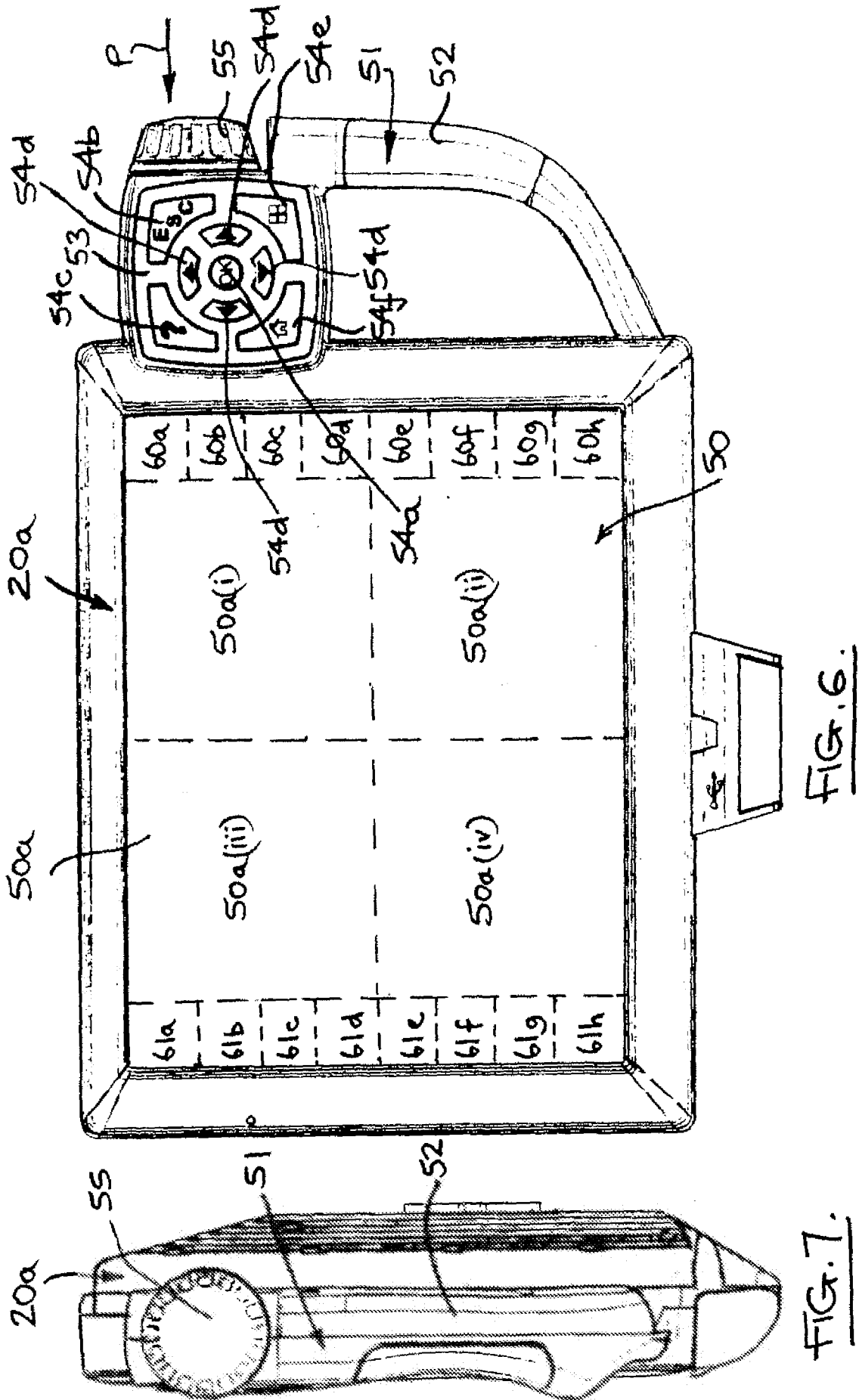


41b



41a

FIG. 5.



# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2010/063604

## A. CLASSIFICATION OF SUBJECT MATTER

INV. B60C23/00  
ADD.

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)  
B60C

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 practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                               | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | US 5 629 873 A (MITTAL CHANDER P [US] ET AL) 13 May 1997 (1997-05-13)<br>column 6, lines 27-34; figures 1a-1b<br>column 8, lines 52-54<br>column 10, lines 11-24 | 1-19                  |
| X         | WO 2004/085172 A2 (INGRAM RUPERT II [ZA])<br>7 October 2004 (2004-10-07)<br>page 9, line 28 - page 10, line 20;<br>figures 1-3                                   | 1-19                  |
| X         | WO 00/34060 A1 (CASE CORP [US])<br>15 June 2000 (2000-06-15)<br>page 6, line 10 - page 7, line 17; figures 3,4                                                   | 1-19                  |
| X         | EP 1 306 233 A1 (MAZDA MOTOR [JP])<br>2 May 2003 (2003-05-02)<br>figures 1,8-13                                                                                  | 1-19                  |

☐ 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
- "E" earlier document but published on or after the international filing date
- "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

11 November 2010

Date of mailing of the international search report

06/12/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Brito, Fernando

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2010/063604

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 20  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 20

No meaningful opinion on this claim could be established, as it lacks essential features to define the subject-matter for what protection is sought.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2010/063604

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date                                                                                                                             |
|-------------------------------------------|---------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| US 5629873                                | A                   | 13-05-1997                 | NONE                                                                                                                                            |
| WO 2004085172                             | A2                  | 07-10-2004                 | NONE                                                                                                                                            |
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