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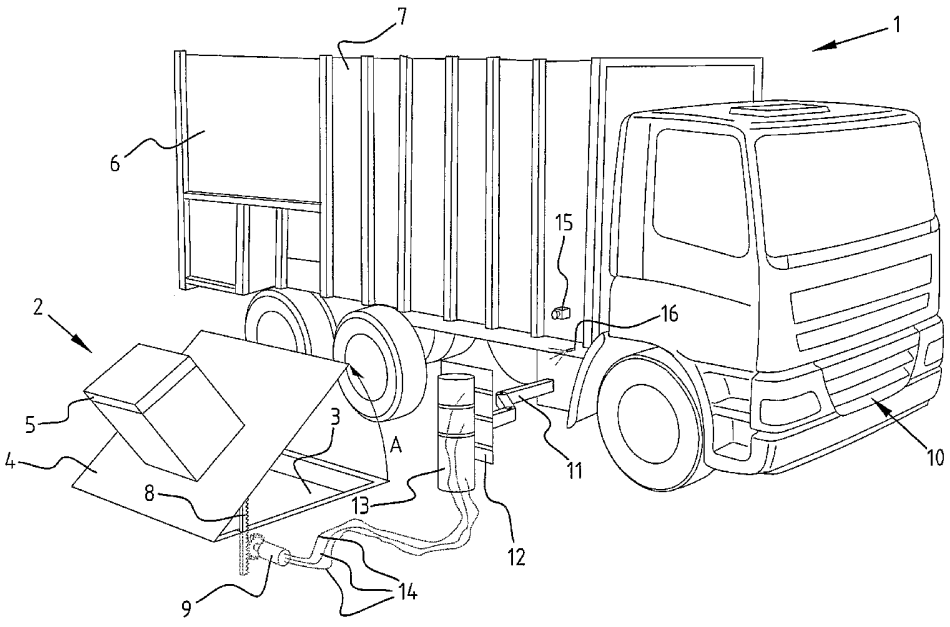
(54) Title: VEHICLE WITH POWER SUPPLY FOR EXTERNAL INSTALLATION



(57) Abstract: The present invention relates to a vehicle (1). The vehicle comprises a mobile frame; at least one component on or at the frame to be energized with a power supply, and a power source on or at the frame for providing the power supply to the component, characterized by an external connection (12) which is connected to the power source and which can be connected to an external installation (13, 14, 9) for selective energizing thereof with the power supply.

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VEHICLE WITH POWER SUPPLY FOR EXTERNAL INSTALLATION

The present invention relates to a vehicle and a system with such a vehicle and at least one external installation, and a method.

The vehicle comprises a mobile frame, at least one component on or at the frame to be energized with a power supply, and a power source on or at the frame for providing the power supply to the component.

Such vehicles are generally known in usual systems. Refuse collection trucks for instance drive to collection locations where containers are disposed for the purpose of emptying thereof, or to underground refuse dumps which have thereon a cover for opening and/or closing. Also known are: tanker trucks which travel on filling station routes for the purpose of filling the underground tanks of these stations. These may be unmanned filling stations with for instance a lighting system which only has to be energized when passenger cars or trucks come in to fill up, or when the tanker truck comes to the filling station to fill the underground tanks.

The vehicles herein often call in at very many different external installations, which are not necessarily located a great distance from each other but which may also be provided at very remote locations. It is this which is the drawback of the known art. In the case of for instance remote filling stations, a supply of electricity must be laid on to the remote location in order to light such a filling station and in any case to also feed the other components of an on-site electrical installation. Owing to the remoteness of such a filling station the laying of an electricity supply is costly and time-consuming, and unauthorized access to the electrical

power supply provided on-site is difficult to prevent and/or control. For instance in the case of an underground or buried refuse dump having a cover thereon, a motor is provided in an external installation formed thereby for selective opening and/or closing of the cover. Such underground refuse dumps are becoming increasingly more common at relatively short distances from each other, and the covers of such external installations must be opened before an underground container can be emptied into for instance a refuse collection truck. The motor applied as actuator for this purpose is normally provided with its own hydraulic, pneumatic or more particularly electrical power supply. Particularly in such an environment as that of an underground refuse dump an electrical power supply, for instance a connection to the mains electricity, must comply with many of the usual requirements in respect of the safety and reliability of mains electricity. Because such underground refuse dumps are often located a short distance from each other, these measures for the safety and reliability of mains electricity must be taken at many different locations a short distance from each other, and the costs for such underground refuse dumps are therefore high.

According to the present invention the problems of the known art are obviated or at least considerably reduced by a vehicle in a system which has the distinguishing characteristic that the vehicle comprises an external connection which is connected to the power source and which can be connected to an external installation for selective energizing thereof with the power supply. There is a therefore no longer any need to provide connection to the mains electricity at remote locations or at locations a short distance from each other and requiring high standards of safety and reliability. There are also applications where use

is for instance made of a hydraulic pump, and according to the present invention the vehicle can then comprise a hydraulic power source, the same applying for pneumatics.

The external connection can preferably be extended in a direction away from the vehicle. A connection can thus be made to provide the power supply to the external installation once the vehicle has drawn at least quite near the external installation. This can take the form of an arm having a coupling on the distal outer end thereof relative to the vehicle for the purpose of transmitting the power supply to the external installation. Such an arm can be a folding arm, a telescopic arm, a swivel arm or other extendable configuration, this producing a favourable, simple and elegant embodiment of the present invention. The external connection is then preferably positioned at the side of the frame relative to the travel direction thereof. This is particularly advantageous when components of the vehicle which have to co-act with the external installation are also positioned on the side of the vehicle, so that the interaction between the vehicle and the external installation and the transmission of power supply takes place in localized manner on the side of the vehicle. It is not however precluded within the scope of the present invention for the external installation to be arranged for instance on the front side of the vehicle and the components for interaction with the external installation on the side thereof. Other configurations are also possible.

The vehicle preferably comprises a drive and a control for extending the external connection. Manual extension of the external connection and optional establishing of contact between the power source and the external installation can thus be rendered unnecessary.

The external connection can preferably be oriented toward a connection point of the external installation. The one-to-one relation between the connection point and the external connection increases convenience of use.

In an embodiment with a drive and a control for the external connection which can be oriented toward a connecting point of the external installation, it is advantageous when the control is adapted for automatic connection and/or contact of the external connection and the connection point. A manual intervention for the purpose of bringing about a power supply to the external installation can thus be unnecessary, although such manual operations may still be desirable in the case that the control and/or the drive for the external connection fails. In such a configuration it can be advantageous that the vehicle further comprises: an imaging system connected to the control for determining the position of the connection point relative to at least the frame. Such imaging systems are also known as "vision". Use can herein be made of a digital camera in the imaging system to enable the external connection to be directed toward and to make contact with the connection point in fully automatic manner on the basis of position determination of the connection point of the external installation.

In a further embodiment the vehicle can comprise cleaning means which act on the external connection for cleaning thereof. This can be particularly favourable in preventing dirt from impeding or preventing electrical, pneumatic, hydraulic or other contact.

In yet another embodiment the vehicle can comprise communication means associated with the external connection for exchange of use data. Such a use data can comprise: filling data of a container of an underground refuse dump, authorization data relating to the use of the external

installation in combination with the vehicle, control data for switching lighting on or off at the external installation, control data for switching pump means on or off, and so on.

A single non-limitative embodiment of the present invention will be described hereinbelow with reference to the accompanying figure, wherein it is noted that it will already be apparent from the foregoing that diverse other embodiments are possible within the scope of the present invention.

Shown in the figure is a refuse collection truck 1 which is intended and suitable for emptying a container 3 of an underground refuse dump 2. The underground refuse dump 2 comprises a cover 4 with a pillar 5 for throwing in refuse which then comes to lie in container 3. The refuse collection truck 1 itself comprises a filling opening 6, wherein means are arranged for engaging container 3, lifting container 3 out of the underground refuse dump 2 and emptying container 3 into a loading space 7 of refuse collection truck 1.

Prior to emptying of container 3 the cover 4 of the underground refuse dump 2 must be swung open in the direction of arrow A. Provided for this purpose is a gear rack 8 on which acts an electric motor 9 in the underground refuse dump 2. This electric motor 9 is situated underground in, adjacently of or close to the underground refuse dump 2. No connection to the mains electricity is provided at the underground refuse dump 2, and according to the present invention the motor 9 is energized with power supply from a power source on, at or close to the refuse collection truck 1. This power supply can be formed by the battery or the dynamo of the refuse collection truck 1 in the motor compartment 10 thereof.

Arranged on the side relative to the travel direction of refuse collection truck 1 is an extendable arm 11 having a

coupling 12 on the distal outer end relative to the refuse collection truck 1 itself. Coupling 12 is designed and adapted to bring about contact with an upright 13 which is in stationary position in the vicinity of the underground refuse dump 2. Running between upright 13 and electric motor 9 are conductors 14 for providing power supply from refuse collection vehicle 2 to electric motor 9 when coupling 12 makes contact with upright 13. No battery or connection to the mains electricity need therefore be provided for electric motor 9.

The arm 11 shown in the figure is combined folding and swivel arm. It is noted that other types of arm can also be used, such as for instance a telescopic arm etc. What is important here is that an external connection is formed by the combination of arm 11 and coupling 12 for the purpose of providing power supply to an actuator formed for instance by electric motor 9 at the external installation in the form of an underground refuse dump. Lighting can likewise be placed at the underground refuse dump 2 which can also be fed from refuse collection vehicle 1.

In order to provide power supply to the external installation in the form of underground refuse dump 2 the external connection formed by arm 11 and coupling 12 is oriented toward a connection point in the form of upright 13. Use is preferably made for this purpose of a drive and a control for at least the arm, so that a driver of refuse collection vehicle 1 does not have to leave the cab, so that a fully automated system can be provided according to the present invention. Use can even be made herein of an imaging system, of which a preferably digital camera 15 is arranged on the side of refuse collection vehicle 1 and which is connected to a control (not shown) for transmitting image for the purpose of determining the position of upright 13 which

forms the connection point for the external connection 11, 12. The location of upright 13 can be determined from the image from camera 15, whereafter the control (not shown) in co-action with a drive (not shown) of the external connection 11, 12 can realize power supply to external installation 2.

Cleaning means are also provided on the refuse collection vehicle 1 in the form of a sprayer 16 for cleaning at least the coupling 12 of external connection 11, 12.

It is further noted that coupling 12 and upright 13 are adapted to not only provide power supply to the external installation 2 but also to exchange use data. Refuse collection vehicle 1 comprises for this purpose communication means which can exchange the use data with communication means of external installation 2. This is non-limitative and shown symbolically in that more than two conductors 14 are provided, wherein two conductors 14 are required for providing electrical power supply and a third conductor 14 can be used for exchange of the use data.

It will be apparent that after examination of the foregoing description of a very specific, but non-limitative embodiment, many alternative and additional embodiments will occur to the skilled person. These all lie within the scope of protection as defined in the appended claims, unless there is an embodiment which differs in essential respects from the spirit or definition according to the claims of the invention. It is thus possible that the vehicle is not a refuse collection truck but a tanker truck for supplying a filling station which is substantially unmanned and wherein lighting of the filling station can be switched on or switched off from such a tanker truck. The actuator of the external installation can particularly also be pneumatic or hydraulic, and is thus not limited to an electrical power supply. A design of the coupling will be used for this

purpose which differs from that described above and shown in the figure. In the case of an underground refuse dump such as that described above and shown in figure, a compensation, for instance a mechanical compensation, can be provided for the weight of the cover over the container, so that a very light electric motor 9 can be applied and a power supply in low-voltage form at for instance 24 V is possible. A sprayer is shown and described as cleaning means. This can spray liquid over the coupling, although precisely this can be disadvantageous in the case of an electrical power supply. The sprayer can then also be intended and adapted to generate an airflow in order to blow the coupling clean.

CLAIMS

1. Vehicle, comprising: a mobile frame; at least one component on or at the frame to be energized with a power supply; and a power source on or at the frame for providing the power supply to the component, characterized by an external connection which is connected to the power source and which can be connected to an external installation for selective energizing thereof with the power supply.

2. Vehicle as claimed in claim 1, wherein the power supply is one of a group comprising: electricity, in particular low voltage; hydraulics; pneumatics etc.

3. Vehicle as claimed in claim 1 or 2, wherein the external connection can be extended in a direction away from the vehicle.

4. Vehicle as claimed in claim 3, wherein the external connection comprises an arm on the vehicle having a coupling on the distal outer end of the arm relative to the vehicle for the purpose of transmitting the power supply to the external installation.

5. Vehicle as claimed in claim 4, wherein the arm is one of a group comprising: a folding arm, a telescopic arm, a swivel arm, a combined folding and swivel arm etc.

6. Vehicle as claimed in claim 3, 4 or 5, wherein the external connection is positioned at the side of the frame relative to the travel direction thereof.

7. Vehicle as claimed in at least one of the claims 3-6, further comprising a drive and a control for extending the external connection.

8. Vehicle as claimed in at least one of the claims 3-7, wherein the external connection can be oriented toward a connection point of the external installation.

9. Vehicle as claimed in claims 7 and 8, wherein the control is adapted to automatically direct the external connection to and/or bring it into contact with the connection point using the drive.

10. Vehicle as claimed in claim 9, further comprising an imaging system connected to the control for determining the position of the connection point relative to at least the frame.

11. Vehicle as claimed in at least one of the foregoing claims, further comprising cleaning means which act on the external connection for cleaning thereof.

12. Vehicle as claimed in at least one of the foregoing claims, further comprising communication means associated with the external connection for exchange of use data.

13. System comprising a vehicle as claimed in at least one of the foregoing claims and at least one external installation which can be connected via the external connection to the power source of the vehicle for the purpose of energizing the external installation.

14. System as claimed in claim 13, wherein the external installation is one of a group comprising: a filling location for taking in of fuel by the vehicle and having lighting to be selectively switched on; a pump with pump means to be selectively switched on; an underground refuse dump with a cover to be selectively opened, preferably with a mechanical system at least partially compensating the weight of the cover; a device enclosed with a fence to be selectively opened and/or closed; etc.

15. System as claimed in claim 13 or 14, wherein the external installation comprises an actuator which is one of a group comprising: an electric motor; a hydraulic apparatus; a pneumatic apparatus; etc.

16. System as claimed in at least one of the claims 13, 14 and 15, wherein the external installation comprises communication means for exchange of use data with communication means of the vehicle via the external connection thereof.

17. System as claimed in at least one of the claims 13-16, wherein the vehicle is a refuse collection truck, and the external installation is an underground refuse dump which comprises a cover to be selectively opened and/or closed with an actuator without power source in the external installation, wherein the power source can be connected via the external connection to the actuator.

18. Method comprising of: driving with a vehicle as claimed in at least one of the claims 1-12 to at least one external installation in a system as claimed in at least one of the claims 13-16; and selectively energizing the external installation with a power source on or at the frame of the vehicle.

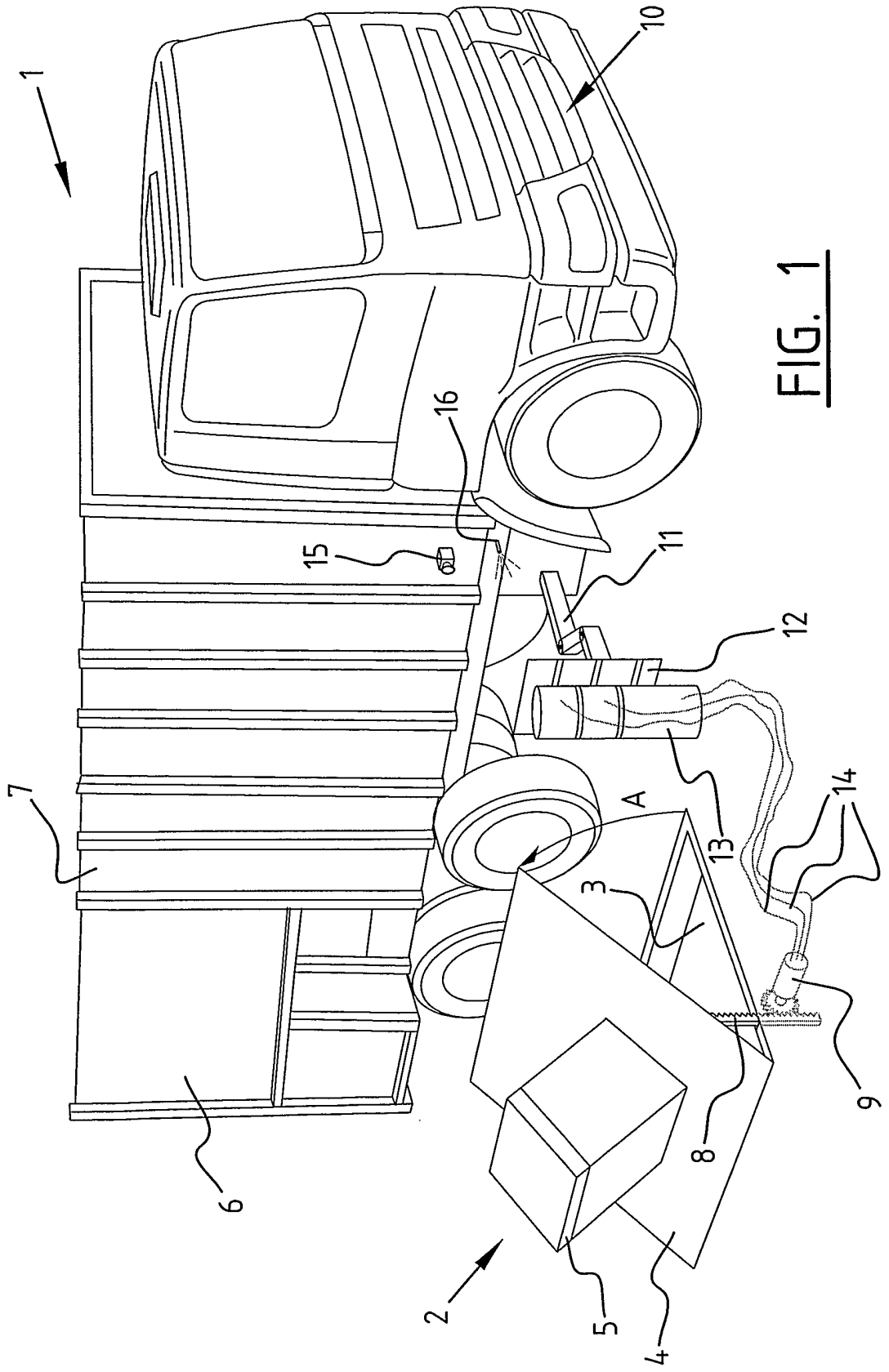

FIG. 1

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
W/2CP42/MT-23		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/NL2005/000808	23/11/2005	03/12/2004
Applicant		
TERBERG MACHINES B.V.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [ ] the text is approved as submitted by the applicant
   [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 1
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2005/000808

A. CLASSIFICATION OF SUBJECT MATTER
B65F3/00

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)
B65F H02J H01F

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, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 2004 014639 U (L. SCHATZINGER ET AL.) 2 December 2004 (2004-12-02) the whole document	1-4,7-9, 13-15,18
X	US 5 348 125 A (R. STRIBLING) 20 September 1994 (1994-09-20) column 3, line 34 - column 4, line 55 figures 1-3	1-3,6, 13-15,18
X	NL 1 006 782 C (BAMMENS BV) 16 February 1999 (1999-02-16) page 2, line 24 - page 4, line 21 figures 1,2	1,2, 13-15, 17,18

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[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

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"P" document published prior to the international filing date but later than the priority date claimed

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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
31 January 2006	09/02/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Smolders, R

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INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2005/000808

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 140 786 A (G. GALEAZZI) 25 August 1992 (1992-08-25) column 3, line 21 - line 33 figure 4 -----	1,2, 13-15, 17,18
X	EP 0 576 405 A (D. BIONDI) 29 December 1993 (1993-12-29) column 3, line 1 - line 11 figure 1 -----	1,2, 13-15,18

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2005/000808

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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