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(54) **VEHICLE WITH POWER SUPPLY FOR EXTERNAL INSTALLATION**

FAHRZEUG MIT ENERGIEVERSORGUNG FÜR EXTERNE ANLAGE

VÉHICULE AVEC ALIMENTATION ÉLECTRIQUE POUR UNE INSTALLATION EXTÉRIEURE

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EP 1 817 246 B1

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Description

[0001] The present invention relates to a refuse collection truck, a system with such a refuse collection truck and at least one external installation, and a method, according to the preambles of claims 1, 12 and 16 respectively. 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.

[0002] The refuse collection trucks 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. 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 distance from each other, these measures for the safety and reliability of mains electricity must be taken at many different locations a distance from each other, and the costs for such underground refuse dumps are therefore high.

[0003] It is known from DE-U-20 2004 014 639, US-A-5.348.125 and NL-C-1.006.782 to selectively energize drive components of remote installations with energy originating from a vehicle. Document NL-C-1.006.782 discloses a refuse collection truck according to the preamble of claim 1 in which an external connection 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. According to the invention the refuse collection truck furthermore comprises 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 refuse collection truck, control data for switching lighting on or off at the external installation, control data for switching pump means on or off, and so on. In a preferred embodiment the external connection can preferably be extended in a direction away from the refuse collection truck. A connection can thus be made to provide the power supply to the external installation once the refuse collection truck has drawn at least quite near the external installation. This can take the form of an extendable arm having a coupling on the distal outer end thereof relative to the refuse collection truck 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 mobile frame relative to the travel direction thereof. This is particularly advantageous when components of the refuse collection truck which have to co-act with the external installation are also positioned on the side of the refuse collection truck, so that the interaction between the refuse collection truck and the external installation and the transmission of power supply takes place in localized manner on the side of the refuse collection truck. 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.

[0004] The refuse collection truck preferably comprises a drive and a control for extending the extendable arm of 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.

[0005] 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.

[0006] 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 installa-

tion 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 mobile 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.

[0007] In a further embodiment the refuse collection truck 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.

[0008] A single non-limitative embodiment of the present invention will be described hereinbelow with reference to the accompanying figure. 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 mobile frame, at least one component on or at the mobile frame to be energized with a power supply, and 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.

[0009] 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 the motor 9 is energized with power supply from a power source on or at the mobile frame of the refuse collection truck 1. This power source can be formed by the battery or the dynamo of the refuse collection truck 1 in the motor compartment 10 thereof.

[0010] Arranged on the side relative to the travel direction of refuse collection truck 1 is an external connection which comprises 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 truck 1 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.

[0011] 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 truck 1.

[0012] 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 truck 1 does not have to leave the cab, so that a fully automated system can be provided. 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 truck 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.

[0013] Cleaning means are also provided on the refuse collection truck 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 not only to provide power supply to the external installation 2 but also to exchange use data. Refuse collection truck 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.

[0014] 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. 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. Refuse collection truck (1), comprising:

- a mobile frame;
- at least one component on or at the mobile frame to be energized with a power supply;
- a power source on or at the mobile frame for providing the power supply to the component; and
- an external connection (11,12) which is connected to the power source and which can be connected to an external installation (2) for selective energizing thereof with the power supply;

CHARACTERIZED BY

- communication means (14) comprising a conductor associated with the external connection (11, 12) for exchange of use data.
2. Refuse collection truck (1) as claimed in claim 1, wherein the power supply is one of a group comprising: electricity, in particular low voltage; hydraulics; pneumatics.
 3. Refuse collection truck (1) as claimed in claim 1 or 2, wherein the external connection (11, 12) can be extended in a direction away from the refuse collection truck (1).
 4. Refuse collection truck (1) as claimed in claim 3, wherein the external connection (11, 12) comprises an extendable arm (11) on the refuse collection truck (1) having a coupling (12) on the distal outer end of the extendable arm (11) relative to the refuse collection truck (1) for the purpose of transmitting the power supply to the external installation (2).
 5. Refuse collection truck (1) as claimed in claim 4, wherein the extendable arm (11) is one of a group comprising: a folding arm, a telescopic arm, a swivel arm, a combined folding and swivel arm.
 6. Refuse collection truck (1) as claimed in claim 3, 4 or 5, wherein the external connection (11, 12) is positioned at the side of the mobile frame relative to the travel direction thereof.

7. Refuse collection truck (1) as claimed in at least one of the claims 4-6, further comprising a drive and a control for extending the extendable arm (11) of the external connection (11, 12).

8. Refuse collection truck (1) as claimed in at least one of the claims 3-7, wherein the external connection (11, 12) can be oriented toward a connection point of the external installation (2).

9. Refuse collection truck (1) as claimed in claims 7 and 8, wherein the control is adapted to automatically direct the external connection (11, 12) to and/or bring it into contact with the connection point using the drive.

10. Refuse collection truck (1) as claimed in claim 9, further comprising an imaging system (15) connected to the control for determining the position of the connection point relative to at least the mobile frame.

11. Refuse collection truck (1) as claimed in at least one of the foregoing claims, further comprising cleaning means (16) which act on the external connection (11, 12) for cleaning thereof.

12. System comprising a refuse collection truck (1) as claimed in at least one of the foregoing claims and at least one external installation (2) which can be connected via the external connection (11,12) to the power source of the refuse collection truck (1) for the purpose of energizing the external installation (2) **CHARACTERIZED IN THAT** the external installation (2) comprises communication means for exchange of use data with the communication means (14) of the refuse collection truck (1) via the external connection (11, 12) thereof.

13. System as claimed in claim 12, wherein the external installation (2) is one of a group comprising: a filling location for taking in of fuel by the refuse collection truck (1) and having lighting to be selectively switched on; a pump with pump means to be selectively switched on; an underground refuse dump (2) with a cover (4) 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.

14. System as claimed in claim 12 or 13, wherein the external installation (2) comprises an actuator (9) which is one of a group comprising: an electric motor; a hydraulic apparatus; a pneumatic apparatus.

15. System as claimed in claim 14, wherein the external installation (2) is an underground refuse dump (2) which comprises a cover (4) to be selectively opened and/or closed with the actuator (9).

16. Method comprising of: driving with a refuse collection truck (1) as claimed in at least one of the claims 1-11 to at least one external installation (2) in a system as claimed in at least one of the claims 12-15; and selectively energizing the external installation (2) with the power source on or at the mobile frame of the refuse collection truck (1); **CHARACTERIZED BY** exchanging use data between the external installation (2) and the refuse collection truck (1) via respective communication means (14) for exchange of the use data thereof.

Patentansprüche

1. Müllabfuhr-Lastwagen (1), umfassend:

- einen mobilen Rahmen;
- wenigstens eine Komponente auf oder an dem mobilen Rahmen, der von einer Energieversorgung Energie zugeführt wird;
- eine Energiequelle auf oder an dem mobilen Rahmen zum Bereitstellen der Energieversorgung für die Komponente; und
- eine externe Verbindung (11, 12), die mit der Energiequelle verbunden ist und die an eine externe Anlage (2) angeschlossen werden kann, um dieser selektiv durch die Energieversorgung Energie zuzuführen;

gekennzeichnet durch Kommunikationsmittel (14), die ein mit der externen Verbindung (11, 12) angeschlossenes Kabel umfassen, um Nutzungsdaten auszutauschen.

2. Müllabfuhr-Lastwagen (1) nach Anspruch 1, wobei die Energieversorgung eine aus der Gruppe ist, umfassend: Elektrizität, insbesondere Niederspannung; Hydraulik; Pneumatik.
3. Müllabfuhr-Lastwagen (1) nach Anspruch 1 oder 2, wobei die externe Verbindung (11, 12) in eine vom Müllabfuhr-Lastwagen (1) hinweg gerichtete Richtung ausgefahren werden kann.
4. Müllabfuhr-Lastwagen (1) nach Anspruch 3, wobei die externe Verbindung (11, 12) einen ausfahrbaren Arm (11) am Müllabfuhr-Lastwagen (1) umfasst, der eine Kupplung (12) am äußeren distalen Ende des ausfahrbaren Arms (11) relativ zum Müllabfuhr-Lastwagen (1) hat, um die Energieversorgung zu der externen Anlage (2) zu leiten.
5. Müllabfuhr-Lastwagen (1) nach Anspruch 4, wobei der ausfahrbare Arm (11) einer aus der Gruppe ist, umfassend: einen Faltarm, einen Teleskoparm, einen Schwenkarm, einen kombinierten Falt- und Schwenkarm.

6. Müllabfuhr-Lastwagen (1) nach Anspruch 3, 4 oder 5, wobei die externe Verbindung (11, 12) an der Seite des mobilen Rahmens relativ zu dessen Bewegungsrichtung angebracht ist.

7. Müllabfuhr-Lastwagen (1) nach wenigstens einem der Ansprüche 4-6, ferner einen Antrieb und eine Steuerung zum Ausfahren des ausfahrbaren Arms (11) der externen Verbindung (11, 12) umfassend.

8. Müllabfuhr-Lastwagen (1) nach wenigstens einem der Ansprüche 3-7, wobei die externe Verbindung (11, 12) zu einem Anschlusspunkt der externen Anlage (2) ausgerichtet sein kann.

9. Müllabfuhr-Lastwagen (1) nach Ansprüchen 7 und 8, wobei die Steuerung ausgelegt ist, die externe Verbindung (11, 12) unter Verwendung des Antriebs automatisch zum Anschlusspunkt zu lenken und/oder in Kontakt mit dem Anschlusspunkt zu bringen.

10. Müllabfuhr-Lastwagen (1) nach Anspruch 9, ferner ein bildgebendes System (15) umfassend, das mit der Steuerung verbunden ist, um die Position des Anschlusspunkts relativ zu wenigstens dem mobilen Rahmen zu bestimmen.

11. Müllabfuhr-Lastwagen (1) nach wenigstens einem der vorhergehenden Ansprüche, ferner Reinigungsinstrumente (16) umfassend, die auf die externe Verbindung (11, 12) einwirken, um diese zu reinigen.

12. System, einen Müllabfuhr-Lastwagen (1) nach wenigstens einem der vorhergehenden Ansprüche und wenigstens eine externe Anlage (2) umfassend, die durch die externe Verbindung (11, 12) mit der Energiequelle des Müllabfuhr-Lastwagens (1) verbunden werden kann, um der externen Anlage (2) Energie zuzuführen, **dadurch gekennzeichnet, dass** die externe Anlage (2) Kommunikationsmittel zum Austausch von Nutzungsdaten mit den Kommunikationsmitteln (14) des Müllabfuhr-Lastwagens (1) über dessen externe Verbindung (11, 12) umfasst.

13. System nach Anspruch 12, wobei die externe Anlage (2) eine aus der Gruppe ist, umfassend: eine Einfüllstelle für die Aufnahme von Kraftstoff durch den Müllabfuhr-Lastwagen und mit Beleuchtung, die selektiv angeschaltet werden kann; eine Pumpe mit Pumpinstrumenten, die selektiv angeschaltet werden können; eine unterirdische Müllsammelstelle (2) mit einer Abdeckung (4), die selektiv geöffnet werden kann, vorzugsweise mit einem mechanischen System, das wenigstens teilweise das Gewicht der Abdeckung kompensiert; ein Gerät, das von einem Zaun umschlossen ist, der selektiv geöffnet und/oder geschlossen werden kann.

14. System nach Anspruch 12 oder 13, wobei die externe Anlage (2) einen Aktor (9) umfasst, der einer aus der Gruppe ist, umfassend: ein Elektromotor; eine hydraulische Apparatur; eine pneumatische Apparatur.
15. System nach Anspruch 14, wobei die externe Anlage (2) eine unterirdische Müllsammelstelle (2) ist, die eine Abdeckung (4) umfasst, die durch den Aktor (9) selektiv geöffnet und/oder geschlossen werden kann.
16. Verfahren, umfassend: mit einem Müllabfuhr-Lastwagen (1) nach wenigstens einem der Ansprüche 1-11, zu mindestens einer externen Anlage (2) in einem System nach wenigstens einem der Ansprüche 12-15 zu fahren; und der externen Anlage (2) mit der Energiequelle an oder auf dem mobilen Rahmen des Müllabfuhr-Lastwagens (1) selektiv Energie zuzuführen;
- dadurch gekennzeichnet, dass**
- Nutzungsdaten zwischen der externen Anlage (2) und dem Müllabfuhr-Lastwagen (1) über entsprechende Kommunikationsmittel (14) für den Austausch deren Nutzungsdaten ausgetauscht werden.

Revendications

1. Camion à ordures (1) comprenant :
 - un bâti mobile ;
 - au moins un composant sur ou au niveau du bâti mobile à alimenter avec une alimentation électrique ;
 - une source d'énergie sur ou au niveau du bâti mobile pour fournir l'alimentation électrique au composant ; et
 - un raccordement externe (11, 12) qui est raccordé à la source d'énergie et qui peut être raccordé à une installation externe (2) pour son alimentation sélective avec l'alimentation électrique ;

caractérisé par :

 - des moyens de communication (14) comprenant un conducteur associé au raccordement externe (11, 12) pour échanger des données d'utilisation.
 2. Camion à ordures (1) selon la revendication 1, dans lequel l'alimentation électrique est un élément d'un groupe comprenant : l'électricité, en particulier la basse tension ; l'hydraulique ; le pneumatique.
 3. Camion à ordures (1) selon la revendication 1 ou 2, dans lequel le raccordement externe (11, 12) peut être étendu dans une direction à distance du camion à ordures (1).
 4. Camion à ordures (1) selon la revendication 3, dans lequel le raccordement externe (11, 12) comprend un bras extensible (11) sur le camion à ordures (1) ayant un couplage (12) sur l'extrémité externe distale du bras extensible (11) par rapport au camion à ordures (1) afin de transmettre l'alimentation électrique à l'installation externe (2).
 5. Camion à ordures (1) selon la revendication 4, dans lequel le bras extensible (11) est un élément d'un groupe comprenant : un bras pliable, un bras télescopique, un bras pivotant, un bras pliable et pivotant combiné.
 6. Camion à ordures (1) selon la revendication 3, 4 ou 5, dans lequel le raccordement externe (11, 12) est positionné sur le côté du bâti mobile par rapport à sa direction de déplacement.
 7. Camion à ordures (1) selon au moins l'une des revendications 4 à 6, comprenant en outre un entraînement et une commande pour étendre le bras extensible (11) du raccordement externe (11, 12).
 8. Camion à ordures (1) selon au moins l'une des revendications 3 à 7, dans lequel le raccordement externe (11, 12) peut être orienté vers un point de raccordement de l'installation externe (2).
 9. Camion à ordures (1) selon les revendications 7 et 8, dans lequel la commande est adaptée pour diriger automatiquement le raccordement externe (11, 12) vers et/ou l'amener en contact avec le point de raccordement à l'aide de l'entraînement.
 10. Camion à ordures (1) selon la revendication 9, comprenant en outre un système d'imagerie (15) raccordé à la commande pour déterminer la position du point de raccordement par rapport au moins au bâti mobile.
 11. Camion à ordures (1) selon au moins l'une des revendications précédentes, comprenant en outre des moyens de nettoyage (16) qui agissent sur le raccordement externe (11, 12) pour son nettoyage.
 12. Système comprenant un camion à ordures (1) selon au moins l'une des revendications précédentes et au moins une installation externe (2) qui peut être raccordée via le raccordement externe (11, 12) à la source d'énergie du camion à ordures (1) afin d'alimenter l'installation externe (2),
- caractérisé en ce que :**
- l'installation externe (2) comprend des moyens de communication pour échanger des données

d'utilisation avec les moyens de communication (14) du camion à ordures (1) via son raccordement externe (11, 12).

13. Système selon la revendication 12, dans lequel l'installation externe (2) est un élément du groupe comprenant : un emplacement de remplissage pour le prélèvement de carburant par le camion à ordures (1) et ayant un éclairage à mettre sélectivement en marche ; une pompe avec des moyens de pompe pour être sélectivement mise en marche ; une décharge souterraine (2) avec un couvercle (4) destiné à être sélectivement ouvert, de préférence avec un système mécanique compensant au moins partiellement le poids du couvercle ; un dispositif enfermé avec une barrière destinée à être sélectivement ouverte et/ou fermée. 5 10 15
14. Système selon la revendication 12 ou 13, dans lequel l'installation externe (2) comprend un actionneur (9) qui est un élément d'un groupe comprenant : un moteur électrique ; un appareil hydraulique ; un appareil pneumatique. 20
15. Système selon la revendication 14, dans lequel l'installation externe (2) est une décharge souterraine (2) qui comprend un couvercle (4) destiné à être sélectivement ouvert et/ou fermé avec l'actionneur (9). 25
16. Procédé comprenant les étapes suivantes : conduire avec un camion à ordures (1) selon au moins l'une des revendications 1 à 11 jusqu'à au moins une installation externe (2) dans un système selon au moins l'une des revendications 12 à 15 ; et alimenter sélectivement l'installation externe (2) avec la source d'énergie sur ou au niveau du bâti mobile du camion à ordures (1) ; 30 35
- caractérisé par** l'étape suivante consistant à :
- échanger des données d'utilisation entre l'installation externe (2) et le camion à ordures (1), via des moyens de communication (14) respectifs pour l'échange de leurs données d'utilisation. 40 45 50 55

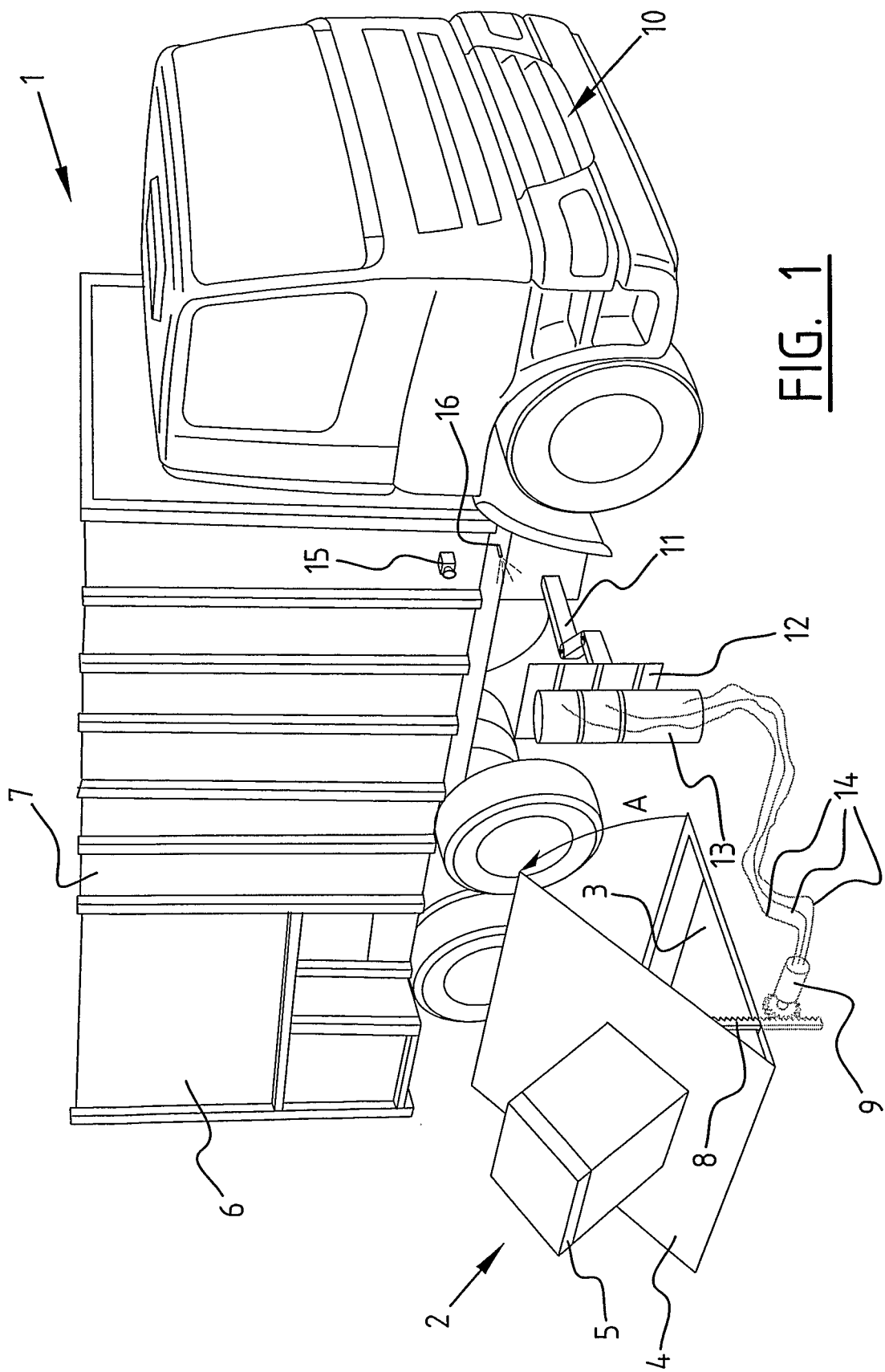


FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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