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(54) **FUEL HOSE HANDLING DEVICE WITH SERVO-MOTOR**

SERVOUNTERSTÜTZTE KRAFTSTOFFSCHLAUCH-HANDHABUNGSEINRICHTUNG

DISPOSITIF DE MANIPULATION DE TUYAU DE CARBURANT AVEC SERVOMOTEUR

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Description

Technical field

[0001] The invention relates to a device and method for handling at least one hose.

Background art

[0002] A fuel dispensing unit, such as a petrol pump typically comprises a pump part standing on the ground, a display part positioned above the pump part and showing the chosen type of petrol, cash readout, volume readout etc., and a column or frame to which one or more petrol hoses are connected.

[0003] When the tank of a vehicle is to be filled up, the driver parks the vehicle beside the petrol pump and opens the cover or cap of the petrol tank. The driver then selects the desired type of petrol and places the pump nozzle in the inlet of the vehicle's petrol tank and puts in the desired volume of petrol.

[0004] A difficulty that may arise in connection with filling-up is that the hose does not reach to the vehicle if parked a distance from the petrol pump. The reason why the vehicle has not been parked sufficiently close to the pump may be difficulty in maneuvering owing to a limited space round the petrol pump. To allow the hose to reach the vehicle, it is usually necessary for the driver to park his vehicle so that the side of the vehicle where the filler cap is positioned faces the petrol pump. It is not always known to a driver of an unfamiliar vehicle whether the filler cap is positioned on the left or right side. This may result in the driver by mistake parking the vehicle on the wrong side of the pump and thus not being able to fill up the tank without moving the vehicle to the other side of the petrol pump since the hose does not reach all the way round the vehicle.

[0005] One way of facilitating access to the petrol pump is to provide it with a longer hose. This may, however, cause problems since a longer hose may tend to land on the ground when not used and thus get stuck in or be damaged by passing cars or other vehicles. To prevent this, the fuel dispensing unit may be provided with some kind of returning mechanism for the hose.

[0006] US 6 328 060 discloses a gasoline dispensing unit and method according to which one end of a cord is attached to a dispensing hose to support the hose relative to a dispenser unit during non-use. The other end of the cord is attached to a drum having a tapered outer surface and a continuous spiral groove. When the hose is not in use, the cord is wound on the drum from the largest-diameter drum portion to the smallest-diameter portion. The cord thus unwinds from the drum from its smallest-diameter portion to the largest-diameter portion when the hose is pulled from the housing to provide a mechanical advantage and reduce the required pulling force.

[0007] GB 782 882 discloses a swinging arm hose retriever for fluid dispensing apparatus. The hose of the

fluid dispensing apparatus is retracted by a spring drum which, together with a spring-biased swinging arm, is mounted on a cover replacing the normal cover for the usual aperture in the top of the dispensing cabinet. The cover carries a support from which a spindle and a frame carrying the arm are supported by bearings. A spring connected to a fork pivoted to the spindle biases the arm to its normal position.

[0008] A problem common for the hose returning devices described above is their size, or their extension within the fuel dispensing unit, which results in bulky and complicated structures.

[0009] Another problem with the hose returning devices existing of the market today is that the force required for extracting the hose from the hose housing is quite extensive.

[0010] A device according to the preamble of claim 1 is known from EP 0 647 587 A1.

Summary of the invention

[0011] It is an object of the present invention to provide an improvement of the dispensing units according to prior art. A particular object is to provide a space efficient device for handling a hose of a fuel dispensing unit.

[0012] The invention consists of a device according to claim 1.

[0013] This is advantageous in that an extremely space efficient device for hose handling is provided, which device enables a smooth and flexible handling of the hose. Further, due to the intelligence of the device, the handling of the at least one hose from a customer perspective is highly facilitated.

[0014] The sensor means comprises a first sensor arranged in the hose storage space and configured to detect the idle position the first hose guiding means, and a second sensor arranged in the hose storage space and configured to detect the working position the first hose guiding means.

[0015] The control unit may be configured to trigger extraction of the cable element by means of the motor or to trigger a neutral state of the motor when the working position of the first hose guiding means is detected, and to trigger infeed of the cable element by means of the motor when the idle position of the first hose guiding means is detected.

[0016] The control unit may be configured to trigger extraction of the cable element by means of the motor or to trigger a neutral state of the motor when at least a portion of the first hose guiding means is detected outside of the hose storage space, and to trigger feeding in of the cable element by means of the motor the first hose guiding means is detected inside of the hose storage space.

[0017] The first hose guiding means may comprise a rocker unit which, to allow pulling out and returning of the hose, is pivotable in relation to the hose storage space about a pivot axis and which comprises a hose supporting

part which is arranged at a distance from the pivot axis and adapted to support the hose.

[0018] The rocker unit may be adapted to be pivoted in the first direction when pulling out the hose and, when returning the hose, be pivoted by a rocker returning means, which applies a returning force on the rocker unit at a distance from the pivot axis in the second direction which is opposite to the first direction.

[0019] The rocker returning means may comprise a spring element.

[0020] The first hose guiding means may comprise a rail element to support the hose which, to allow pulling out and returning of the hose, is movable in relation to the hose storage space between in the idle position and the working position.

[0021] The rail element may be adapted to be moved towards the working position when pulling out the hose and, when returning the hose, be moved towards the idle position.

[0022] The sensing means may further comprise a further sensor configured to detected movement of the second hose guiding means, and the control unit is configured to stop the motor when the second hose is in a bottom position within the hose storage space.

[0023] The extraction of the cable element by means of the motor may be conducted for a predetermined length of the cable element.

[0024] The extraction of the cable element by means of the motor may be based on a motor driving power calculated by the control unit.

[0025] According to a second aspect, these and other objects are achieved, in full or at least in part, by a fuel dispensing unit for refueling a vehicle, comprising at least one device according the feature described above.

[0026] According to a third aspect, these and other objects are achieved, in full or at least in part, by a method according to claim 12.

[0027] Anywhere between one and ten hoses may be handled by the device according to the invention.

Brief description of the drawings

[0028] The above objects, as well as additional objects, features and advantages of the present invention, will be more fully appreciated by reference to the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, when taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective view of an exemplary embodiment of a fuel dispensing unit according to a second aspect of the invention.

Fig. 2 is a perspective view of an exemplary embodiment of a device for handling at least one hose according to a first aspect of the invention.

Fig. 3 is a perspective view of the device for handling at least one hose when in an idle position.

Fig. 4 is a perspective view of the device for handling

at least one hose when in a working position.

Detailed description of preferred embodiments of the invention

[0029] Fig. 1 shows an exemplary embodiment of a fuel dispensing unit 1, having hose storage spaces 2, an electrical cabinet 3 containing all the electronics for the fuel dispensing unit 1, a hydraulic cabinet 4 containing fuel dispensing means (not shown), e.g. fuel metering means, valves, vapor recovery system etc., and a column 5 extending vertically between and separating the electrical cabinet 3 and the hydraulic cabinet 4 from the hose storage spaces 2. The fuel dispensing unit 1 is connected to an underground fuel container (not shown).

[0030] When filling up the tank of a vehicle, the fuel is pumped from the underground container by means of a pump (not shown) which is located in the hydraulic cabinet 4, and from there to the column 5 and out to a nozzle 6 via a fuel hose 7. When filling-up does not take place, the fuel hose 7 is accommodated in a hose storage space 2 and the nozzle 6 is inserted in a nozzle boot 8. The hose 7 is handled by a hose handling device according to the invention, which is arranged in every hose storage space 2. The electronics located in the electrical cabinet 3, such as means for choosing the desired type of fuel and display means for showing the chosen type of fuel, the volume of dispensed fuel etc., are securely isolated in order to encapsulate electronic components from possible presence of flammable gases. The electrical cabinet 3 can also include a payment terminal.

[0031] Fig. 2 illustrates a device 9 for handling at least one fuel hose 7 in the fuel dispensing unit 1. The device 9 allows the at least one fuel hose 7 to be pulled out from a front opening of the hose storage space 2 and is adapted to return the at least one fuel hose 7 to the hose storage space 2. The device 9 will now be described in greater detail according to one exemplary embodiment in view of Fig. 3 and 4.

[0032] Fig. 3 and Fig 4 illustrate the device 9 when in an idle position and when in a working position. The device 9 comprises a first hose guiding means 10 and a second hose guiding means 11, which are both movable between an idle position and a working position to control extraction and infeed of the at least one fuel hose 7, a sensor means 12 arranged in hose storage space 2, a motor 13 connected to the second hose guiding means 11 through a cable element 14, and a control unit 15 connected to the sensor means 12 and to the motor 13. The control unit 15 is configured to control the motor 13 based on signals relating to the movements of the first hose guiding means 10 and/or the second hose guiding means 11 detected by the sensor means 12.

[0033] The sensor means 12 comprises a first sensor 16 arranged in the hose storage space 2 and configured to detect the idle position the first hose guiding means 10, and a second sensor 17 arranged in the hose storage space 2 and configured to detect the working position

the first hose guiding means 10.

[0034] Here, as a first option, the control unit 15 may be configured to trigger extraction of the cable element 14 by means of the motor 13 or to trigger a neutral state of the motor 13 when the working position of the first hose guiding means 10 is detected, and to trigger infeed of the cable element 14 by means of the motor 13 when the idle position of the first hose guiding means 10 is detected.

[0035] As a second option, the control unit 15 may be configured to trigger extraction of the cable element 14 by means of the motor 13 or to trigger a neutral state of the motor 13 when at least a portion of the first hose guiding means 10 is detected outside of the hose storage space 2, and to trigger feeding in of the cable element 14 by means of the motor 13 the first hose guiding means 10 is detected inside of the hose storage space 2.

[0036] In this specific embodiment, the first hose guiding means 10 comprises a rocker unit which, to allow pulling out and returning of the hose 7, is pivotable in relation to the hose storage space 2 about a pivot axis 18 and which comprises a hose supporting part 19 which is arranged at a distance from the pivot axis 18 and adapted to support the hose 7. The rocker unit is adapted to be pivoted in a first direction when pulling out the hose 7 and, when returning the hose 7, be pivoted by a rocker returning means 20, constituted by a spring element which applies a returning force on the rocker unit at a distance from the pivot axis 18 in a second direction which is opposite to the first direction.

[0037] In another exemplary embodiment, the first hose guiding means 10 comprises a rail element to support the hose 7 which, to allow pulling out and returning of the hose 7, is movable in relation to the hose storage space 2 between in the idle position and the working position. Here, the rail element is adapted to be moved towards the working position when pulling out the hose 7 and, when returning the hose 7, be moved towards the idle position.

[0038] In an example not part of the invention, the sensor means 12 may for example comprise a two-way sensor instead which is capable of detecting a direction of the movement of the first hose guiding means 10. Here, the control unit would be configured to trigger extraction of the cable element by means of the motor 13 or to trigger a neutral state of the motor when a first moving direction of the first hose guiding means 10 is detected, and to trigger infeed of the cable element by means of the motor 13 when a second moving direction of the first hose guiding means 10 is detected.

[0039] In an example not part of the invention, the sensor means 12 may be connected to a movable portion 21 of an outer housing 22 of the hose storage space 2, and the control unit 15 is configured to trigger extraction of the cable element 14 by means of the motor 13 or to trigger a neutral state of the motor 13 when movement of the movable portion 21 of the outer housing 22, in a direction away from the outer housing 22, is detected.

[0040] The sensing means 12 may further comprise a third sensor 23 configured to detected movement of the second hose guiding means 11, and in this case, the control unit 15 is configured to stop the motor 13 when the second hose guiding means 11 is in a bottom position within the hose storage space 2.

[0041] The skilled person realizes that a number of modifications of the embodiments described herein are possible without departing from the scope of the invention, which is defined in the appended claims.

[0042] The extraction of the cable element 14 by means of the motor 13 may be conducted based on a predetermined length of the cable element 14.

[0043] The extraction of the cable element 14 by means of the motor 13 may be based on a motor driving power calculated by the control unit 15.

[0044] The control unit 15 may be configured so that no infeed of the cable element 14 by means of the motor 13 is possible during refueling of a vehicle.

[0045] The control unit 15 may be configured so that no extraction of the cable element 14 by means of the motor 13 is possible when the nozzle(s) 6 are present in the nozzle boot(s) 8.

[0046] The control unit 15 may be configured so that no feeding of the cable element 14 by means of the motor 13 is possible when the fuel dispensing unit 1 is not released.

Claims

1. A device (9) for handling at least one hose (7), which device (9) allows the at least one hose (7) to be pulled out from a front opening of a hose storage space (2) and which device (9) is adapted to return the at least one hose (7) to the hose storage space (2), the device (9) comprising:

a first hose guiding means (10) and a second hose guiding means (11) movable between an idle position and a working position to control the at least one hose (7),

a sensor means (12) arranged in hose storage space (2),

a motor (13) connected to the second hose guiding means (11) through a cable element (14), and

a control unit (15) connected to the sensor means (12) and to the motor (13),

wherein the control unit (15) is configured to control the motor (13) based on signals relating to the movements of the first hose guiding means (10) and/or the second hose guiding means (11) detected by the sensor means (12),

characterized in that the sensor means (12) comprises a first sensor (16) arranged in the hose storage space (2) and configured to detect the idle position of the first hose guiding means

- (10), and a second sensor (17) arranged in the hose storage space (2) and configured to detect the working position of the first hose guiding means (10).
2. The device (9) according to claim 1, wherein the control unit (15) is configured to trigger extraction of the cable element (14) by means of the motor (13) or to trigger a neutral state of the motor (13) when the working position of the first hose guiding means (10) is detected, and to trigger infeed of the cable element (14) by means of the motor (13) when the idle position of the first hose guiding means (10) is detected.
 3. The device (9) according to claim 1, wherein the control unit (15) is configured to trigger extraction of the cable element (14) by means of the motor (13) or to trigger a neutral state of the motor (13) when at least a portion of the first hose guiding means (10) is detected outside of the hose storage space (2), and to trigger feeding in of the cable element (14) by means of the motor (13) the first hose guiding means (10) is detected inside of the hose storage space (2).
 4. The device (9) according to any one of the preceding claims, wherein the first hose guiding means (10) comprises a rocker unit which, to allow pulling out and returning of the hose (7), is pivotable in relation to the hose storage space (2) about a pivot axis (18) and which comprises a hose supporting part (19) which is arranged at a distance from the pivot axis (18) and adapted to support the hose (7).
 5. The device (9) as claimed in claim 5, wherein the rocker unit is adapted to be pivoted in the first direction when pulling out the hose (7) and, when returning the hose (7), be pivoted by a rocker returning means (20), which applies a returning force on the rocker unit at a distance from the pivot axis (18) in the second direction which is opposite to the first direction.
 6. The device (9) as claimed in claim 5 or 6, wherein the rocker returning means (20) comprises a spring element.
 7. The device (9) according to any one of claim 1 to 4, wherein the first hose guiding means (10) comprises a rail element to support the hose (7) which, to allow pulling out and returning of the hose (7), is movable in relation to the hose storage space (2) between in the idle position and the working position.
 8. The device (9) according to claim 8, wherein the rail element is adapted to be moved towards the working position when pulling out the hose (7) and, when returning the hose (7), be moved towards the idle position.
 9. The device (9) according to any one of the preceding claims, wherein the sensor means (12) further comprises a further sensor (23) configured to detect movement of the second hose guiding means (11), and the control unit (15) is configured to stop the motor (13) when the second hose guiding means (11) is in a bottom position within the hose storage space (2).
 10. The device (9) according to any one of claim 1 or 2, wherein extraction of the cable element (14) by means of the motor (13) is conducted for a predetermined length of the cable element (14).
 11. The device (9) according to any one of claim 1 or 2, wherein extraction of the cable element (14) by means of the motor (13) is based on a motor driving power calculated by the control unit (15).
 12. A method for handling at least one hose (7) in a fuel dispensing unit (1), to allow the at least one hose (7) to be pulled out from a front opening of a hose storage space (2) and to return the at least one hose (7) to the hose storage space (2), comprising the steps of:
 - providing a first hose guiding means (10) and a second hose guiding means (11) movable between an idle position and a working position to control extraction and feeding in of the hose (7), and
 - arranging a sensor means (12) in hose storage space (2), the sensor means (12) comprising a first sensor (16) arranged in the hose storage space (2) and configured to detect the idle position of the first hose guiding means (10), and a second sensor (17) arranged in the hose storage space (2) and configured to detect the working position of the first hose guiding means (10)

characterized by the step of controlling a motor (13), connected to the second hose guiding means (11) through a cable element (14), by means of a control unit (15), connected to the sensor means (12) and to the motor (13), based on detected movements of the first hose guiding means (10).

Patentansprüche

1. Vorrichtung (9) zum Handhaben wenigstens eines Schlauchs (7), wobei die Vorrichtung (9) ermöglicht, dass der wenigstens eine Schlauch (7) aus einer vorderen Öffnung eines Schlauchstauraums (2) herausgezogen wird, und wobei die Vorrichtung (9) angepasst ist, um den wenigstens einen Schlauch (7) zu dem Schlauchstauraum (2) zurückzuführen, wobei die Vorrichtung (9) Folgendes umfasst:

- ein erstes Schlauch-Führungsmittel (10) und ein zweites Schlauch-Führungsmittel (11), die zwischen einer Ruhestellung und einer Arbeitsstellung beweglich sind, um den wenigstens einen Schlauch (7) zu steuern, ein Sensormittel (12), das in dem Schlauchstauraum (2) angeordnet ist, einen Motor (13), der mit dem zweiten Schlauch-Führungsmittel (11) durch ein Seilelement (14) verbunden ist, und eine Steuereinheit (15), die mit dem Sensormittel (12) und mit dem Motor (13) verbunden ist, wobei die Steuereinheit (15) dafür konfiguriert ist, den Motor (13) auf Grundlage von Signalen in Bezug auf die Bewegungen des ersten Schlauch-Führungsmittels (10) und/oder des zweiten Schlauch-Führungsmittels (11), die durch das Sensormittel (12) erfasst werden, zu steuern, **dadurch gekennzeichnet, dass** das Sensormittel (12) einen ersten Sensor (16), der in dem Schlauchstauraum (2) angeordnet und dafür konfiguriert ist, die Ruhestellung des ersten Schlauch-Führungsmittels (10) zu erfassen, und einen zweiten Sensor (17), der in dem Schlauchstauraum (2) angeordnet und dafür konfiguriert ist, die Arbeitsstellung des ersten Schlauch-Führungsmittels (10) zu erfassen, umfasst.
2. Vorrichtung (9) nach Anspruch 1, wobei die Steuereinheit (15) dafür konfiguriert ist, ein Ausziehen des Seilelements (14) mit Hilfe des Motors (13) auszulösen oder einen neutralen Zustand des Motors (13) auszulösen, wenn die Arbeitsstellung des ersten Schlauch-Führungsmittels (10) erfasst wird, und ein Einziehen des Seilelements (14) mit Hilfe des Motors (13) auszulösen, wenn die Ruhestellung des ersten Schlauch-Führungsmittels (10) erfasst wird.
 3. Vorrichtung (9) nach Anspruch 1, wobei die Steuereinheit (15) dafür konfiguriert ist, ein Ausziehen des Seilelements (14) mit Hilfe des Motors (13) auszulösen oder einen neutralen Zustand des Motors (13) auszulösen, wenn wenigstens ein Abschnitt des ersten Schlauch-Führungsmittels (10) außerhalb des Schlauchstauraums (2) erfasst wird, und ein Einziehen des Seilelements (14) mit Hilfe des Motors (13) auszulösen, wenn das erste Schlauch-Führungsmittel (10) innerhalb des Schlauchstauraums (2) erfasst wird.
 4. Vorrichtung (9) nach einem der vorhergehenden Ansprüche, wobei das erste Schlauch-Führungsmittel (10) eine Kipphebeleinheit umfasst, die, um ein Herausziehen und Zurückführen des Schlauchs (7) zu ermöglichen, im Verhältnis zu dem Schlauchstauraum (2) um eine Schwenkachse (18) schwenkbar ist und die einen Schlauchstützteil (19) umfasst, der in einer Entfernung von der Schwenkachse (18) angeordnet und angepasst ist, um den Schlauch (7) zu stützen.
 5. Vorrichtung (9) nach Anspruch 4, wobei die Kipphebeleinheit angepasst ist, um in der ersten Richtung geschwenkt zu werden, wenn der Schlauch (7) herausgezogen wird und, wenn der Schlauch (7) zurückgeführt wird, durch ein Kipphebel-Rückführungsmittel (20) gekippt zu werden, das eine Rückführungskraft auf die Kipphebeleinheit in einer Entfernung von der Schwenkachse (18) in der zweiten Richtung, die zu der ersten Richtung entgegengesetzt ist, ausübt.
 6. Vorrichtung (9) nach Anspruch 4 oder 5, wobei das Kipphebel-Rückführungsmittel (20) ein Federelement umfasst.
 7. Vorrichtung (9) nach einem der Ansprüche 1 bis 4, wobei das erste Schlauch-Führungsmittel (10) ein Schienenelement umfasst, um den Schlauch (7) zu stützen, das, um ein Herausziehen und Zurückführen des Schlauchs (7) zu ermöglichen, in Verhältnis zu dem Schlauchstauraum (2) zwischen der Ruhestellung und der Arbeitsstellung beweglich ist.
 8. Vorrichtung (9) nach Anspruch 7, wobei das Schienenelement angepasst ist, um hin zu der Arbeitsstellung bewegt zu werden, wenn der Schlauch (7) herausgezogen wird, und, wenn der Schlauch (7) zurückgeführt wird, hin zu der Ruhestellung bewegt zu werden.
 9. Vorrichtung (9) nach einem der vorhergehenden Ansprüche, wobei das Sensormittel (12) ferner einen weiteren Sensor (23) umfasst, der dafür konfiguriert ist, eine Bewegung des zweiten Schlauch-Führungsmittels (11) zu erfassen, und die Steuereinheit (15) dafür konfiguriert ist, den Motor (13) anzuhalten, wenn sich das zweite Schlauch-Führungsmittel (11) in einer unteren Stellung innerhalb des Schlauchstauraums (2) befindet.
 10. Vorrichtung (9) nach einem der Ansprüche 1 oder 2, wobei das Ausziehen des Seilelements (14) mit Hilfe des Motors (13) für eine vorbestimmte Länge des Seilelements (14) durchgeführt wird.
 11. Vorrichtung (9) nach einem der Ansprüche 1 oder 2, wobei das Ausziehen des Seilelements (14) mit Hilfe des Motors (13) auf einer Motor-Antriebsleistung beruht, die durch die Steuereinheit (15) berechnet wird.
 12. Verfahren zum Handhaben wenigstens eines Schlauchs (7) in einer Kraftstoff-Abgabeeinheit (1), um zu ermöglichen, dass der wenigstens eine

Schlauch (7) aus einer vorderen Öffnung eines Schlauchstauraums (2) herausgezogen wird, und um den wenigstens einen Schlauch (7) zu dem Schlauchstauraum (2) zurückzuführen, das die folgenden Schritte umfasst:

Bereitstellen eines ersten Schlauch-Führungsmittels (10) und eines zweiten Schlauch-Führungsmittels (11), die zwischen einer Ruhestellung und einer Arbeitsstellung beweglich sind, um ein Ausziehen und ein Einziehen des Schlauchs (7) zu steuern,
Anordnen eines Sensormittels (12) in dem Schlauchstauraum (2), wobei das Sensormittel (12) einen ersten Sensor (16), der in dem Schlauchstauraum (2) angeordnet und dafür konfiguriert ist, die Ruhestellung des ersten Schlauch-Führungsmittels (10) zu erfassen, und einen zweiten Sensor (17), der in dem Schlauchstauraum (2) angeordnet und dafür konfiguriert ist, die Arbeitsstellung des ersten Schlauch-Führungsmittels (10) zu erfassen, umfasst,
gekennzeichnet durch den Schritt des Steuerns eines Motors (13), der mit dem zweiten Schlauch-Führungsmittel (11) durch ein Seilelement (14) verbunden ist, mit Hilfe einer Steuereinheit (15), die mit dem Sensormittel (12) und mit dem Motor (13) verbunden ist, auf Grundlage von erfassten Bewegungen des ersten Schlauch-Führungsmittels (10).

Revendications

1. Dispositif (9) de manipulation d'au moins un flexible (7), lequel dispositif (9) permet à au moins un flexible (7) d'être tiré d'une ouverture avant d'un espace de stockage de flexible (2) et lequel dispositif (9) est adapté pour ramener le au moins un flexible (7) vers l'espace de stockage de flexible (2), le dispositif (9) comprenant :

un premier moyen de guidage de flexible (10) et un deuxième moyen de guidage de flexible (11) mobiles entre une position de repos et une position de travail pour commander le au moins un flexible (7),
un moyen de capteur (12) disposé dans l'espace de stockage de flexible (2),
un moteur (13) raccordé au deuxième moyen de guidage de flexible (11) par un élément de câble (14), et une unité de commande (15) raccordée au moyen de capteur (12) et au moteur (13),
dans lequel l'unité de commande (15) est configurée pour commander le moteur (13) sur la base de signaux relatifs aux mouvements du

premier moyen de guidage de flexible (10) et/ou du deuxième moyen de guidage de flexible (11) détectés par le moyen de capteur (12),
caractérisé en ce que le moyen de capteur (12) comprend un premier capteur (16) disposé dans l'espace de stockage de flexible (2) et configuré pour détecter la position de repos du premier moyen de guidage de flexible (10), et un deuxième capteur (17) disposé dans l'espace de stockage de flexible (2) et configuré pour détecter la position de travail du premier moyen de guidage de flexible (10).

2. Dispositif (9) selon la revendication 1, dans lequel l'unité de commande (15) est configurée pour déclencher l'extraction de l'élément de câble (14) au moyen du moteur (13) ou pour déclencher un état neutre du moteur (13) lorsque la position de travail du premier moyen de guidage de flexible (10) est détectée, et de déclencher l'avance de l'élément de câble (14) au moyen du moteur (13) lorsque la position de repos du premier moyen de guidage de flexible (10) est détectée.
3. Dispositif (9) selon la revendication 1, dans lequel l'unité de commande (15) est configurée pour déclencher l'extraction de l'élément de câble (14) au moyen du moteur (13) ou pour déclencher un état neutre du moteur (13) lorsqu'au moins une partie du premier moyen de guidage de flexible (10) est détectée à l'extérieur de l'espace de stockage de flexible (2), et de déclencher l'introduction de l'élément de câble (14) au moyen du moteur (13), le premier moyen de guidage de flexible (10) est détecté à l'intérieur de l'espace de stockage de flexible (2).
4. Dispositif (9) selon une quelconque des revendications précédentes, dans lequel le premier moyen de guidage de flexible (10) comprend une unité à bascule qui, pour permettre l'extraction et le retour du flexible (7), peut pivoter par rapport à l'espace de stockage de flexible (2) autour d'un axe de pivotement (18) et qui comprend une partie de support de flexible (19) qui est disposée à distance de l'axe de pivotement (18) et adaptée pour supporter le flexible (7).
5. Dispositif (9) selon la revendication 4, dans lequel l'unité à bascule est adaptée pour être pivotée dans la première direction lors de l'extraction du flexible (7) et, lors du retour du flexible (7), être pivotée par un moyen de rappel à bascule (20), qui applique une force de rappel sur l'unité à bascule à une distance de l'axe de pivotement (18) dans la deuxième direction qui est opposée à la première direction.
6. Dispositif (9) selon la revendication 4 ou 5, dans lequel le moyen de rappel à bascule (20) comprend

un élément à ressort.

7. Dispositif (9) selon une quelconque des revendications 1 à 4, dans lequel le premier moyen de guidage de flexible (10) comprend un élément de rail pour supporter le flexible (7) qui, pour permettre l'extraction et le retour du flexible (7), est mobile par rapport à l'espace de stockage de flexible (2) entre la position de repos et la position de travail. 5
8. Dispositif (9) selon la revendication 7, dans lequel l'élément de rail est adapté pour être déplacé vers la position de travail lors du retrait du flexible (7) et, lors du retour du flexible (7), être déplacé vers la position de repos. 10 15
9. Dispositif (9) selon une quelconque des revendications précédentes, dans lequel le moyen de capteur (12) comprend en outre un autre capteur (23) configuré pour détecter le mouvement du deuxième moyen de guidage de flexible (11), et l'unité de commande (15) est configurée pour arrêter le moteur (13) lorsque le deuxième moyen de guidage de flexible (11) est dans une position inférieure à l'intérieur de l'espace de stockage de flexible (2). 20 25
10. Dispositif (9) selon une quelconque des revendications 1 ou 2, dans lequel l'extraction de l'élément de câble (14) au moyen du moteur (13) est effectuée sur une longueur prédéterminée de l'élément de câble (14). 30
11. Dispositif (9) selon une quelconque des revendications 1 ou 2, dans lequel l'extraction de l'élément de câble (14) au moyen du moteur (13) est basée sur une puissance d'entraînement du moteur calculée par l'unité de commande (15). 35
12. Procédé de manipulation d'au moins un flexible (7) dans une unité de distribution de carburant (1), pour permettre à au moins un flexible (7) d'être tiré d'une ouverture avant d'un espace de stockage de flexible (2) et de ramener le au moins un flexible (7) vers un espace de stockage de flexible (2), comprenant les étapes consistant à : 40 45
 - fournir un premier moyen de guidage de flexible (10) et un deuxième moyen de guidage de flexible (11) mobile entre une position de repos et une position de travail pour commander l'extraction et l'avance du flexible (7), et
 - disposer un moyen de capteur (12) dans l'espace de stockage de flexible (2), le moyen de capteur (12) comprenant un premier capteur (16) disposé dans l'espace de stockage de flexible (2) et configuré pour détecter la position de repos du premier moyen de guidage de flexible (10), et un deuxième capteur (17) disposé dans

l'espace de stockage de flexible (2) et configuré pour détecter la position de travail du premier moyen de guidage de flexible (10),
caractérisé par l'étape de commande d'un moteur (13), raccordé au deuxième moyen de guidage de flexible (11) à travers un élément de câble (14), au moyen d'une unité de commande (15), raccordée au moyen de détection (12) et au moteur (13), sur la base des mouvements détectés du premier moyen de guidage de flexible (10).

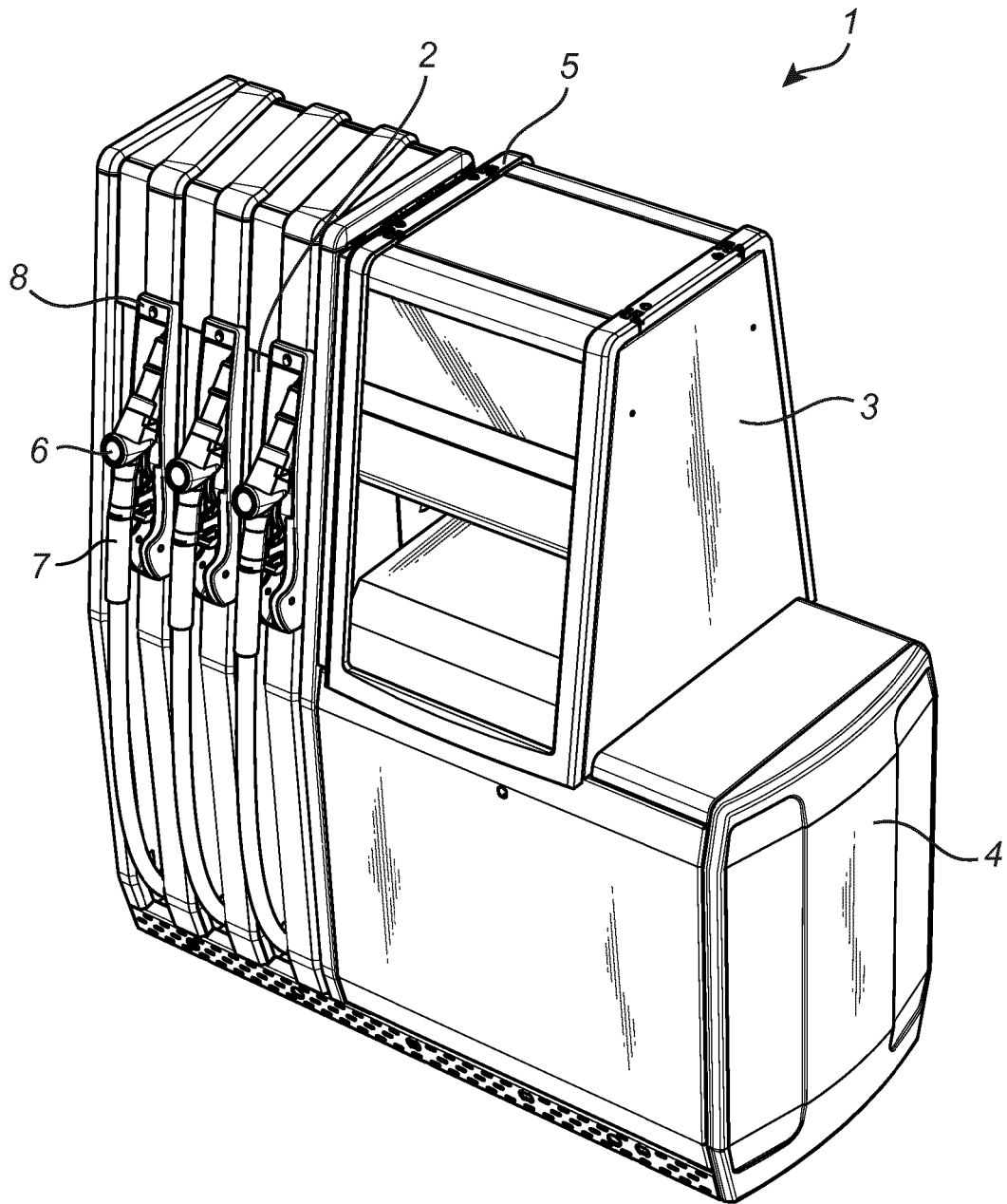


Fig. 1

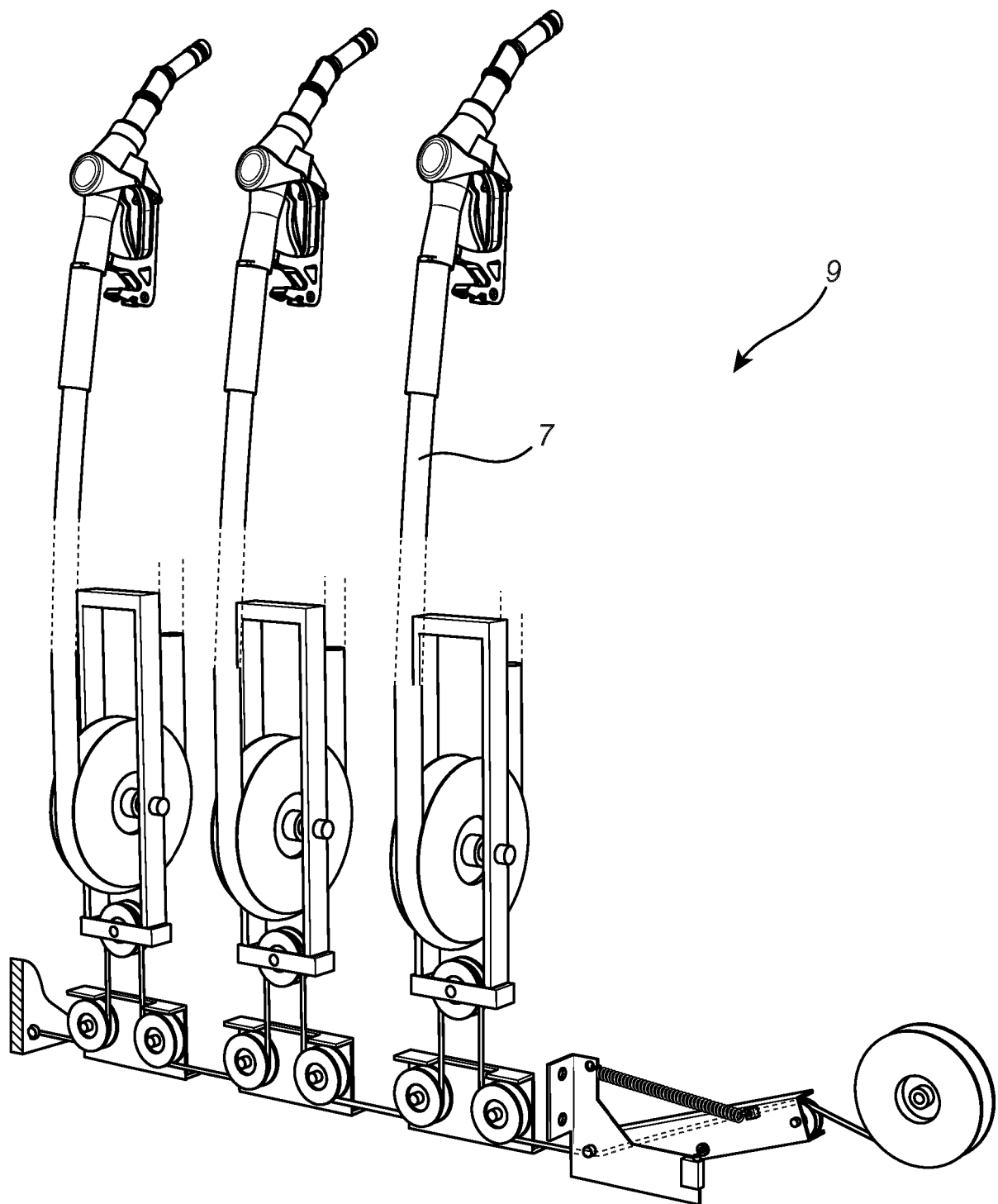


Fig. 2

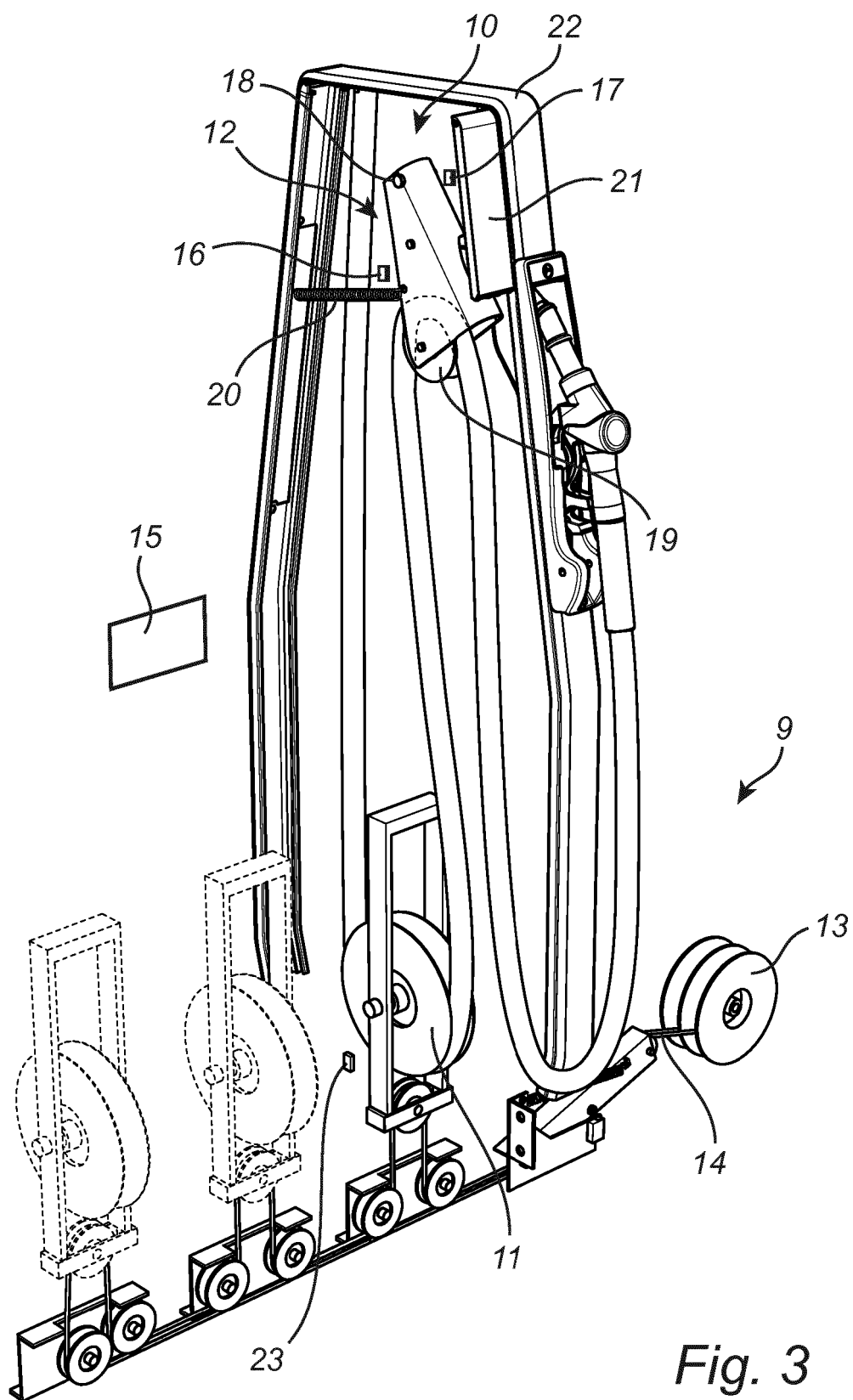


Fig. 3

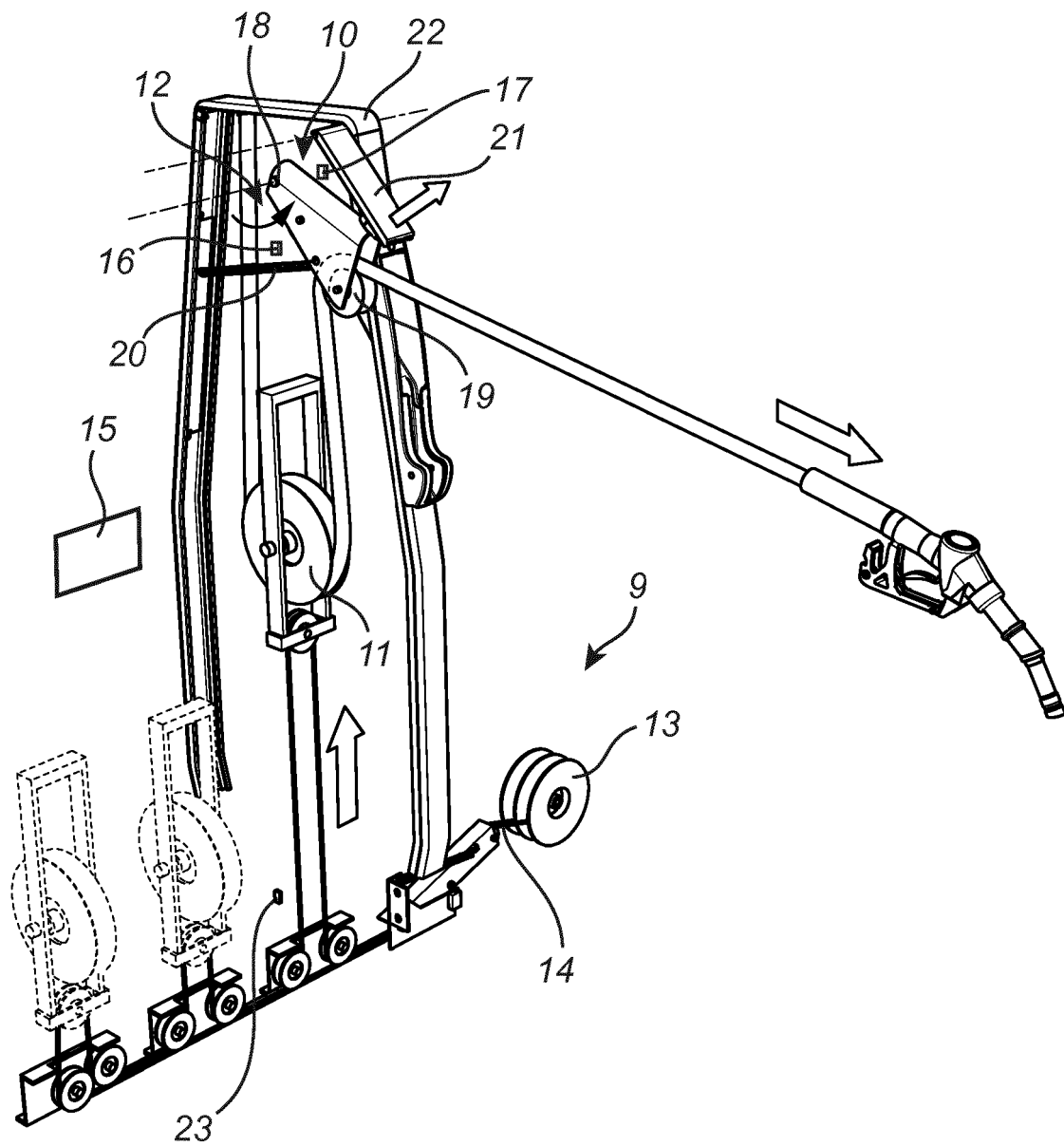


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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