Hose carrier for fuel dispenser
Schlauchausleger für Zapfsäulen
Enrouleur de tuyau pour distributeur de carburant

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References cited:
EP-A- 0 647 587
EP-A- 1 331 200
EP-A- 1 845 057

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Description

Field of invention

[0001] The invention relates to a dispensing system for dispensing fuel to a vehicle. The dispensing system comprises a hose storage space with an at least partly open front portion, a hose connection, and a hose being at one end connected to the hose connection and at the other end being provided with a dispensing mouth.

Technical background

[0002] When designing a fuel pump for use in fuel stations or the like there are a plurality of design requirements that the designer want to meet. It is desired that the fuel pump is able to present a relatively long fuelling hose to the user about to refuel his/hers vehicle making it possible to refuel the vehicle even if it is parked at a distance or with the refuelling point on the opposite side of the vehicle. It is further desired that the fuel hose is collected or even retracted into a storage space once refuelling is completed, thereby minimizing the risk of the fuel hose being hit or run over by a vehicle. It is also desired to be able to present a relatively long hose to the user and still from a cost perspective be able to have a hose that is in fact relatively short. It is also desired that the user has a perception that the fuel hose is on one hand securely controlled by the fuel pump during use and securely collected or retracted after use and on the other hand the hose should be easily pulled out with no effort needed.

[0003] There exists a number of different solutions aiming at providing a hose handling system taking these different and other design criteria into consideration.

[0004] EP 1 243 549 A1 and EP 1 253 106 A1 disclose a design of a fuel pump where the hose is connected to a fuel hose connection arranged in a top portion of a hose storage space and runs down and around a first pulley and up around a second pulley. The first pulley is adapted to be moveable upwardly against the force of a spring. The second pulley is mounted on a rocker unit which is pivotable relative to a hose storage space. When the user grabs the fuel dispenser head the second pulley will due to its pivoting allow the portion of the hose extending from the second pulley to the dispenser head to be pulled out of the storage space. When the user needs additional fuel hose, he/she continues to pull the dispenser head and the hose may be payed over the second pulley. The additional available length is provided by the first pulley being pulled upwardly. A similar design with a moveable first pulley and a second pulley arranged on a rocker unit is also disclosed in EP 1 331 200 A1 and in EP 1 398 294 A1. The preamble is based on this disclosure.

[0005] EP 1 845 057 also discloses a design of a fuel pump where the hose is connected to a fuel hose connection arranged in a top portion of a hose storage space and runs down and around a first pulley and up around a second pulley. In this design the first pulley is mounted on carrier part having the form of a swing lever.

[0006] Although successful in many aspects they are associated with some drawbacks. The designs all provide means for a secure retraction but are not able to present all the available hose to the user.

[0007] In this context a design in which the hose is connected to a fuel hose connection arranged in a top, front portion a hose storage space should also be discussed. The hose runs in a ring shaped member which is connected to a cord which in turn is biased to pull the ring shaped member and thereby also pull a portion of the hose backwardly and upwardly into the hose storage space. This design makes good use of the available hose but may by the user to be perceived as a non-secure retraction device. It is also associated with the drawback that the ring shaped member may get stuck outside the storage space.

[0008] A dispensing system according to the preamble of claim 1 is known from EP 0 647 587 A1.

Summary of invention

[0009] An object of the invention is to provide a solution taken into account one or preferably a plurality of the above mentioned design criteria. The above object has been met with a dispensing system for dispensing fuel to a vehicle, the dispensing system comprising a hose storage space with an at least partly open front portion, a hose connection, and a hose being at one end connected to the hose connection and at the other end being provided with a dispensing mouth. The dispensing system further comprises a first hose guide member, and a second hose guide member being moveably arranged in the hose storage space. The hose is in a retracted state adapted to extend from the hose connection to the first hose guide member, in front of and below the first hose guide member, backwardly towards the second hose guide member and above and behind the second hose guide member. The second hose guide member is moveable back and forth in the hose storage space, such that the second hose guide member is moveable forwardly towards the front portion for allowing extraction of the hose and is moveable backwardly from the front portion of the hose storage space for retraction of the hose into the hose storage space and the first hose guide member is in position fixedly arranged in the hose storage space.

[0010] By designing the dispensing system in this manner it is possible to provide a secure and distinct retraction of the hose into the hose storage space while it is still possible to present a long hose to the user and also make full use of the actual length of the hose. To what extent these possibilities are actually utilised will also be dependent upon other factors.

[0011] In the following the invention will be discussed in more detail in accordance with a preferred embodiment.
In a preferred embodiment the second hose guide member is moveable in an inclined downward, forward direction towards, and possibly also below and past the first hose guide member for extraction of the hose and back again for retraction of the hose.

In the retracted state the hose extends to, in front of and below the first hose guide member. From the first hose guide member, the hose continues backwardly towards the second hose guide member and above and behind the second hose guide member. From the second hose guide member the hose will hang freely downwardly from the second hose guide member and form a free loop back upwardly and slightly forwardly to a dispenser head securely hung in a dispenser head storage space at a front of the dispensing system. Since the second hose guide member has retracted the upper portion of the free loop of the hose and the other end of the free loop is formed of the dispenser head securely hung in the dispenser head storage space, the free loop of the hose will securely be positioned behind the dispenser head, i.e. in the hose storage space.

As the user extracts the hose, the second hose guide member will be pulled outwardly by the hose extending above and behind it. The second hose guide member will be moved closer to the first hose guide member along the extension of the hose as viewed along the hose in a direction from the second hose guide member to the first hose guide member. This will change the starting point of the free hanging loop and more and more hose will become available to the user. As the hose is pulled out the hose will also abut the underside of the second hose guide member more and more. It is possible to design the dispensing system such that the second hose guide member may be pulled past the first hose guide member in a forward direction. When the second hose guide member is located directly below the first hose guide member the hose will only abut the second hose guide member on the backside and underside. When the second hose guide member is pulled past the first hose guide member in the forward direction, the hose will extend to the first hose guide member and then in a forward direction with the second hose guide member located above the hose.

If the hose connection is located directly above the point where the hose extends between the first hose guide member and the second hose guide member (when the second hose guide member is pulled past the first hose guide member) the complete actual length of the hose will become useful to the user. Preferred embodiments of the invention will become apparent from the dependent claims and from the detailed description.

The second hose guide member may be resiliently biased backwardly from the front portion of the hose storage space in order to retract the hose into the hose storage space. This is a simple and reliable way of providing the retraction of the hose.

The second hose guide member may be moveable such that the hose in an extracted state is adapted to extend from the hose connection to the first hose guide member and extending below the second hose guide member. This way the dispensing system will make efficient use of the actual length of the hose and present a long hose to the user.

The second hose guide member may be connected to an elastic or elastically fastened cord shaped member biasing the second hose guide member backwardly from the front portion of the hose storage space. This is a simple and reliable way of providing the retraction of the hose. Moreover, the cord shaped member may easily be guided if considered useful. The cord shaped member is also efficient to use since it will allow movement in the transverse direction and allow some pivoting of the second hose guide member without causing any jamming effect. The cord shaped member will only provide a biasing force in its longitudinal direction. The cord may e.g. be an elastic cord thereby in itself provide elasticity. The cord may e.g. as an alternative be a wire wound about a rotatable, spring biased pulley or the like thereby being elastically fastened.

The cord shaped member may be adapted to extend along and to be guided by the first hose guide member as the second hose guide member is pulled forwardly past the first hose guide member. This way the second hose guide member may be pulled past the first hose guide member in a controlled manner.

The first hose guide member may be located inside the hose storage space. This way the hose may be completely retracted into hose storage space and thereby be protected by the hose storage space from accidentally being hit by a vehicle or the like.

The second hose guide member may be arranged to be located behind the first hose guide member as the hose is in a retracted state. This provides a secure and distinct retraction. In this context may be interpreted as at least located backwardly relative the first hose guide member and preferably also substantially on the same height such that the hose will be arced slightly upwardly when passing above the second hose guide member.

The first hose guide member is in position fixedly arranged in the hose storage space. This provides a secure guiding of hose and second hose guide member.

The second hose guide member may be adapted to follow the first hose guide member as the second hose guide member is pulled along the first hose guide member and to be guided by the hose storage space as it is retracted into the hose storage space. This is a reliable and simple manner of providing a secure guiding of the second hose guide member and the hose.

The hose connection may be located at a top portion of the hose storage space, and it may preferably also be located at a front portion of the hose storage space. This will make efficient use of the available length of the hose.
[0025] The first hose guide member may be located at a front portion of the hose storage space, and it may preferably also be located at a top portion of the hose storage space. This will make efficient use of the available length of the hose.

[0026] Other preferred embodiments and other advantages with the invention will be apparent from the detailed description.

Brief description of the drawings

[0027] The invention will by way of example be described in more detail with reference to the appended schematic drawings, which shows a presently preferred embodiment of the invention

Fig 1 discloses in cross-section a dispensing system with a hose fully retracted into a hose storage space.

Fig 2 discloses in cross-section the dispensing system of fig 1 with the hose partly extracted from the hose storage space.

Fig 3 discloses in cross-section the dispensing system of fig 1 and fig 2 with hose fully extracted from the hose storage space.

Detailed description of preferred embodiment

[0028] As is apparent from fig 1, the dispensing system 1 comprises a hose storage space 2. This hose storage space 2 is typically formed as a rectangular space inside a housing 3. The hose storage space has an open front portion. Thus, the hose storage space is basically a rectangular box with one open side. The width of the box (in the direction normal to the drawings) is slightly larger than the diameter of the hose. This kind of hose storage space is well-known in the art.

[0029] The dispensing system 1 further comprises a hose connection 4. The hose connection 4 is located at a top front portion of the hose storage space 2. A hose 5 is at one end connected to the hose connection and at the other end the hose 5 is provided with a dispensing mouth 6 at the end of a dispenser head 7.

[0030] The dispensing system 1 further comprises a first hose guide member e.g. in the form of a guide wheel 8. The wheel 8 is in position fixedly arranged inside the hose storage space 2. It is prevented from performing any translational movement. The wheel 8 is located at a front (and preferably also top) portion of the hose storage space 2. The hose 5 abuts the wheel 8 along a part of the circumference and the wheel 8 thereby forms an arc shaped first hose guide member. The hose 5 may slide along or abut rollers on the envelope surface of the first hose guide member. The hose 5 extends from the hose connection 4 comes into contact with the wheel 8 at point P1. The hose 5 is trained in front of the wheel 8, continues below the wheel 8 and extends partly upwardly backwardly along the wheel 8 before it looses contact with the wheel 8 at point P2. The hose connection 4 is located directly above point P1 such that the hose 5 will extend vertically downwardly from the hose connection 4 to the initial contact with wheel 8.

[0031] The hose 5 extends upwardly backwardly from wheel 8 to a second hose guide member 9. The second hose guide member is preferably formed as a pulley 9. Alternatively the hose 5 may slide along or abut rollers on the envelope surface of the second hose guide member. In such a case the second hose guide member may e.g. be arc shaped. The relevant arc is basically indicated by point P3 and point P4 where the hose 5 is adapted to abut the second hose guide member 9. In the retracted state as shown in fig 1, the hose 5 comes into contact with the pulley 9 at point P3 and is trained above and behind the pulley 9 and looses contact with the pulley 9 at point P4. The direction followed along the hose 5 is viewed from the hose connection 4 towards the dispensing mouth 6.

[0032] The pulley 9 is moveable back and forth in the hose storage space 2. The pulley 8 is rotatably journalled in a housing 10, e.g. formed of a pair of plate shape members 10. The housing 10 or plate shaped members 10 are in turn connected to an elastic cord 11 biasing the pulley 8 backwardly and upwardly towards the position shown in fig 1. The design of the housing 10 may vary. It is e.g. conceivable to use only one plate or simply connected the cord 11 to a shaft extending through the pulley 9. The disclosed design is preferred since the plate shaped members 10 may help in guiding the pulley 9 and especially when the pulley 9 is in the fully extracted position as shown in fig 3 since it is possible to design the plate shaped members 10 such that they will still extend into the hose storage space 2 even when the pulley 9 is in this fully extracted position (fig 3). The housing 10 may also be formed as an injection-moulded plastic part or the like. In any case, the housing 10 should be shaped to be moveable inside the hose storage space 2 and it should follow the wheel 8 and the hose storage space 2 the pulley 9 is pulled past the wheel 8.

[0033] When the pulley 9 is in the position shown in fig 1, the hose 5 is hanging down from the pulley 9 forming a free loop securely positioned inside the hose storage space 2. The dispenser head 7 is positioned in a dispenser head holding space 12. The pulley 9 is (when the hose 5 is retracted) located behind the wheel 8 and preferably also slightly higher than the wheel 8. The directions upwardly, downwardly, forwardly and backwardly are indicated by the arrows U, D, F and B, respectively. When indicating a movement along one of said directions it is not necessary that the movement is strictly in parallel with said direction but rather that there is a significant movement along said direction.

[0034] When the user grabs the dispenser head 7 and starts to pull the hose 5, he/she will initially find that the portion of the hose 5 from point P4 to the dispenser head 7 is available. As the user continues to pull the hose 5, the pulley 9 will start to move towards the wheel 8. Thereby the distance between points P2 and P3 will decrease
and the length of the available hose 5 will increase. In fact the available length of the hose 5 will increase about two-fold the movement of pulley 9 since the hose 5 is trained behind the pulley 9. This part of the extraction of the hose 5 is shown in fig 2. The movement of the pulley 9 is guided (in the plane of the hose storage space 2 - i.e. the plane of the drawing) by the force exerted by the hose 5 and the force exerted by the elastic cord 11. The movement of the pulley 9 in the lateral direction (normal to the drawing) is guided by the plate shaped members 10 abutting the inner sides of the hose storage space 2.

As the user continues to pull the hose 5, the pulley 9 is pulled past the wheel 8 in the forward direction. This position is shown in fig 3. The hose 5 extends from the hose connection 4 to the wheel 8 and below the pulley 9. The elastic cord 11 is trained about the wheel 8. The plate shaped members 10 still extend into the hose storage space 2 and also help in providing lateral support for the pulley 9 extending out of the hose storage space 2. The length and resilience of the elastic cord 11 is adapted such that it will provide a biasing of the pulley 9 towards an end position as shown in fig 1 and such that it is impossible (or at least difficult) to pull the pulley 9 past the position as shown in fig 3. This may e.g. be provided by arranging a relatively rigid wire inside a tubular elastic cord. Since the housing 10 still extends partly into the hose storage space 2 the pulley 9 will be laterally supported and the hose 5 is in turn guided by the pulley 9. It may be acceptable to allow the pulley 9 to be pulled past the position shown in fig 3 if the plate shaped members 10, the training of the cord 11 about wheel 8, or a sufficiently short distance between hose connection 4 and point P1 is considered to provide adequate lateral guidance for the pulley 9. Alternatively if the distance between hose connection 4 and the wheel 8 is short enough the hose 5 may in itself provide the limit concerning to which extent the pulley 9 may be pulled out of the hose storage space 2.

The wheel 8 and the pulley 9 has a circumference provided with a circumferential groove adapted to the diameter of the hose 5 in order to guide the hose 5. The wheel 8 may also be provided with a second smaller circumferential groove at the bottom of the first groove in order to securely guide the cord 11 as the pulley 9 is moved past the wheel 8.

The pulley 9 is resiliently biased backwardly from the front portion of the hose storage space 2 by the elastic cord 11. When the user has refuelled his/her vehicle, the user releases the hose 5, whereby the pulley 9 returns to its backward, upward position as shown in fig 1 and thereby pulls the hose 5 back into the hose storage space 2. The user then returns the dispenser head 7 to the dispenser head storage space 12.

Claims

1. A dispensing system (1) for dispensing fuel to a vehicle, the dispensing system (1) comprising a hose storage space (2) with an at least partly open front portion, a hose connection (4), a hose (5) being at one end connected to the hose connection (4) and at the other end being provided with a dispensing mouth (6), a first hose guide member (8), and a second hose guide member (9) being moveably arranged in the hose storage space (2), that the hose (5) in a retracted state is adapted to extend from the hose connection (4) to the first hose guide member (8), in front of and below the first hose guide member (8), backwardly towards the second hose guide member (9) and above and behind the second hose guide member (9), characterised in that the second hose guide member (9) is moveable back and forth in the hose storage space (2); forwardly (F) towards the front portion of the hose guide member (8), backwardly (B) from the front portion of the hose storage space (2) for retraction of the hose (5) into the hose storage space (2), and that the first hose guide member (8) is in position fixedly arranged in the hose storage space (2).

2. Dispensing system (1) according to claim 1, wherein the second hose guide member (9) is resiliently biased backwardly (B) from the front portion of the hose storage space (2) in order to retract the hose (5) into the hose storage space (2).

3. Dispensing system (1) according to claim 1 or 2, wherein the second hose guide member (9) is moveable such that the hose (5) in an extracted state is adapted to extend from the hose connection (4) to the first hose guide member (8) and extending below the second hose guide member (9).

4. Dispensing system (1) according to any one of claims 1-3, wherein the second hose guide member (9) is connected to an elastic or elastically fastened cord shaped member (11) biasing the second hose guide member (9) backwardly from the front portion of the hose storage space (2).

5. Dispensing system (1) according to claim 4, wherein the cord shaped member (11) is adapted to extend along and to be guided by the first hose guide member (8) as the second hose guide member (9) is pulled forwardly past the first hose guide member (8).

6. Dispensing system (1) according to any one of claims 1-5, wherein the first hose guide member (8) is located inside the hose storage space (2).

7. Dispensing system (1) according to any one of claims 1-6, wherein the second hose guide member
8. Dispensing system (1) according to any one of claims 1-7, wherein the second hose guide member (9) is arranged to be located behind the first hose guide member (8) as the hose (5) is in a retracted state.

9. Dispensing system (1) according to any one of claims 1-8, wherein the second hose guide member (9) is adapted to follow the first hose guide member (8) as the second hose guide member (9) is pulled along the first hose guide member (8) and to be guided by the hose storage space (2) as it is retracted into the hose storage space (2).

10. Dispensing system (1) according to any one of claims 1-9, wherein the first hose guide member (8) is located at a front portion of the hose storage space (2).

11. Dispensing system (1) according to any one of claims 1-10, wherein the first hose guide member (8) is located at a top portion of the hose storage space (2).

12. Dispensing system (1) according to any one of claims 1-11, wherein the first hose guide member (8) is located at a top portion of the hose storage space (2).

Patentansprüche

1. Abgabesystem (1) zum Abgeben von Kraftstoff an ein Fahrzeug, wobei das Abgabesystem (1) Folgendes umfasst:

   einen Schlauchaufbewahrungsraum (2) mit einem wenigstens teilweise offenen vorderen Abschnitt, einen Schlauchanschluss (4), einen Schlauch (5), der an dem einen Ende an den Schlauchanschluss (4) angeschlossen ist und an dem anderen Ende mit einer Abgabepflichtigkeit (6) versehen ist, ein erstes Schlauchführungselement (8) und ein zweites Schlauchführungselement (9), das beweglich in dem Schlauchaufbewahrungsraum (2) angeordnet ist, wobei der Schlauch (5) dafür eingerichtet ist, sich in einem eingeengten Zustand von dem Schlauchanschluss (4) zu dem ersten Schlauchführungselement (8) nach vorn und durch das erste Schlauchführungselement (9) und über und hinter dem zweiten Schlauchführungselement (9) zu erstrecken dadurch gekennzeichnet, dass das zweite Schlauchführungselement (9) in dem Schlauchaufbewahrungsraum (2) rückwärts und vorwärts bewegt werden kann; nach vorn (F) zu dem vorderen Abschnitt hin, um ein Ausziehen des Schlauches (5) zu ermöglichen, und nach hinten (B) von dem vorderen Abschnitt des Schlauchaufbewahrungsraumes (2) aus zum Einziehen des Schlauches (5) in den Schlauchaufbewahrungsraum (2), und dass das erste Schlauchführungselement (8) in seiner Position unbeweglich in dem Schlauchaufbewahrungsraum (2) angeordnet ist.

2. Abgabesystem (1) nach Anspruch 1, wobei das zweite Schlauchführungselement (9) elastisch von dem vorderen Abschnitt des Schlauchaufbewahrungsraumes (2) aus nach hinten (B) vorgespannt wird, um den Schlauch (5) in den Schlauchaufbewahrungsraum (2) einzuziehen.

3. Abgabesystem (1) nach Anspruch 1 oder 2, wobei das zweite Schlauchführungselement (9) derart bewegt werden kann, dass der Schlauch (5) dafür eingerichtet ist, sich in einem ausgezogenen Zustand von dem Schlauchanschluss (4) bis zu dem ersten Schlauchführungselement (8) zu erstrecken und sich unter dem zweiten Schlauchführungselement (9) erstreckt.

4. Abgabesystem (1) nach einem der Ansprüche 1 bis 3, wobei das zweite Schlauchführungselement (9) mit einem elastischen oder elastisch befestigten seilförmigen Element (11) verbunden ist, welches das zweite Schlauchführungselement (9) von dem vorderen Abschnitt des Schlauchaufbewahrungsraumes (2) aus nach hinten vorspannt.

5. Abgabesystem (1) nach Anspruch 4, wobei das seilförmige Element (11) dafür eingerichtet ist, sich entlang des ersten Schlauchführungselement (8) zu erstrecken und durch dasselbe geführt zu werden, wenn das zweite Schlauchführungselement (9) an dem ersten Schlauchführungselement (8) vorbei nach vorn gezogen wird.

6. Abgabesystem (1) nach einem der Ansprüche 1 bis 5, wobei das erste Schlauchführungselement (8) innerhalb des Schlauchaufbewahrungsraumes (2) angeordnet ist.

7. Abgabesystem (1) nach einem der Ansprüche 1 bis 6, wobei das zweite Schlauchführungselement (9) so angeordnet ist, dass es sich hinter dem ersten Schlauchführungselement (8) befindet, wenn sich der Schlauch (5) in einem eingeengten Zustand befindet.

8. Abgabesystem (1) nach einem der Ansprüche 1 bis
7. wobei das zweite Schlauchführungselement (9) dafür eingerichtet ist, dem ersten Schlauchführungselement (8) zu folgen, wenn das zweite Schlauchführungselement (9) entlang des ersten Schlauchführungselements (8) gezogen wird, und durch den Schlauchaufbewahrungsraum (2) geführt zu werden, wenn es in den Schlauchaufbewahrungsraum (2) eingezogen wird.

9. Abgabesystem (1) nach einem der Ansprüche 1 bis 8, wobei der Schlauchanschluss (4) an einem oberen Abschnitt des Schlauchaufbewahrungsraumes (2) angeordnet ist.

10. Abgabesystem (1) nach einem der Ansprüche 1 bis 9, wobei der Schlauchanschluss (4) an einem vorderen Abschnitt des Schlauchaufbewahrungsraumes (2) angeordnet ist.

11. Abgabesystem (1) nach einem der Ansprüche 1 bis 10, wobei das erste Schlauchführungselement (8) an einem vorderen Abschnitt des Schlauchaufbewahrungsraumes (2) angeordnet ist.

12. Abgabesystem (1) nach einem der Ansprüche 1 bis 11, wobei das erste Schlauchführungselement (8) an einem oberen Abschnitt des Schlauchaufbewahrungsraumes (2) angeordnet ist.

Revendications

1. Système de distribution (1) pour distribuer du carburant à un véhicule, ledit système de distribution (1) comprenant un espace de stockage de tuyau (2) avec une partie avant au moins partiellement ouverte, un raccord flexible (4), un tuyau (5) étant à une extrémité raccordé au raccord flexible (4) et à l’autre extrémité muni d’un orifice de distribution (6), un premier élément guide de tuyau (8), et un second élément guide de tuyau (9) étant disposé de manière mobile dans l’espace de stockage de tuyau (2), le tuyau (5) dans un état rétracté est apte à se étendre du raccord flexible (4) au premier élément guide de tuyau (8), à l’avant de et en-dessous du premier élément guide de tuyau (8), vers l’arrière vers le second élément guide de tuyau (9) et au-dessus et derrière le second élément guide de tuyau (9), caractérisé en ce que le second élément guide de tuyau (9) est déplaçable d’avant en arrière dans l’espace de stockage du tuyau (2) ; vers l’avant (F) vers la partie avant pour permettre l’extraction du tuyau (5) et vers l’arrière (B) depuis la partie avant de l’espace de stockage du tuyau (2) pour la rétractation du tuyau (5) dans l’espace de stockage du tuyau (2), et

en ce que le premier élément guide de tuyau (8) est en position disposé fixement dans l’espace de stockage du tuyau (2).

2. Système de distribution (1) selon la revendication 1, où le second élément guide de tuyau (9) est biaisé de manière élastique vers l’arrière (B) depuis la partie avant de l’espace de stockage du tuyau (2) afin de rétracter le tuyau (5) dans l’espace de stockage du tuyau (2).

3. Système de distribution (1) selon la revendication 1 ou 2, où le second élément guide de tuyau (9) est mobile de sorte que le tuyau (5) dans un état extrait soit apte à s’étendre depuis le raccord flexible (4) vers le premier élément guide de tuyau (8) et s’étendre en-dessous du second élément guide de tuyau (9).

4. Système de distribution (1) selon l’une quelconque des revendications 1-3, où le second élément guide de tuyau (9) est raccordé à un élément en forme de corde élastique ou accroché de manière élastique (11) biaisant le second élément guide de tuyau (9) vers l’arrière depuis la partie avant de l’espace de stockage du tuyau (2).

5. Système de distribution (1) selon la revendication 4, où l’élément en forme de corde (11) est apte à se prolonger et à être guidé par le premier élément guide de tuyau (8) tandis que le second élément guide de tuyau (9) est tiré vers l’avant devant le premier élément guide de tuyau (8).

6. Système de distribution (1) selon l’une quelconque des revendications 1-5, où le premier élément guide de tuyau (8) est placé à l’intérieur de l’espace de stockage du tuyau (2).

7. Système de distribution (1) selon l’une quelconque des revendications 1-6, où le second élément guide de tuyau (9) est disposé pour être placé derrière le premier élément guide de tuyau (8) tandis que le tuyau (5) se trouve dans un état rétracté.

8. Système de distribution (1) selon l’une quelconque des revendications 1-7, où le second élément guide de tuyau (9) est apte à suivre le premier élément guide de tuyau (8) tandis que le second élément guide de tuyau (9) est tiré le long du premier élément guide de tuyau (8) et à être guidé par l’espace de stockage du tuyau (2) tandis qu’il est rétracté dans l’espace de stockage du tuyau (2).

9. Système de distribution (1) selon l’une quelconque des revendications 1-8, où le raccord flexible (4) est placé au niveau d’une partie supérieure de l’espace
10. Système de distribution (1) selon l’une quelconque des revendications 1-9, où le raccord flexible (4) est placé sur une partie avant de l’espace de stockage du tuyau (2).

11. Système de distribution (1) selon l’une quelconque des revendications 1-10, où le premier élément guide de tuyau (8) est placé sur une partie avant de l’espace de stockage du tuyau (2).

12. Système de distribution (1) selon l’une quelconque des revendications 1-11, où le premier élément guide de tuyau (8) est placé sur une partie supérieure de l’espace de stockage du tuyau (2).
REFERENCES CITED IN THE DESCRIPTION

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