



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**27.04.2022 Bulletin 2022/17**

(51) International Patent Classification (IPC):  
**B67D 7/04** <sup>(2010.01)</sup> **B67D 7/40** <sup>(2010.01)</sup>  
**B67D 7/84** <sup>(2010.01)</sup>

(21) Application number: **21203471.4**

(52) Cooperative Patent Classification (CPC):  
**B67D 7/04; B67D 7/403; B67D 7/406; B67D 7/84**

(22) Date of filing: **19.10.2021**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO  
PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**KH MA MD TN**

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(30) Priority: **23.10.2020 SE 2051243**

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(54) **IMPROVED FUEL DISPENSING UNIT**

(57) The invention relates to a device (1) for handling a hose (2), which device (1) allows the hose (2) to be pulled out from a front opening of a hose storage space (3) and which device (1) is adapted to return the hose (2) to the hose storage space (3). The device (1) comprises a first hose guiding means (4) arranged in an upper section of the hose storage space (3), and a second hose guiding means (5) arranged in a lower section of the hose storage space (3). The second hose guiding means (5) is movably attached to a rear section of the hose storage space (3) and adapted to move along the rear section in a vertical direction (V) between an idle position in the lower section of the hose storage space (3) and a working position in the upper section of the hose storage space (3) to control the hose (2). The invention also related to a method for mounting of a hose handling device (1) in a hose storage space (3) of a fuel dispensing unit (23).

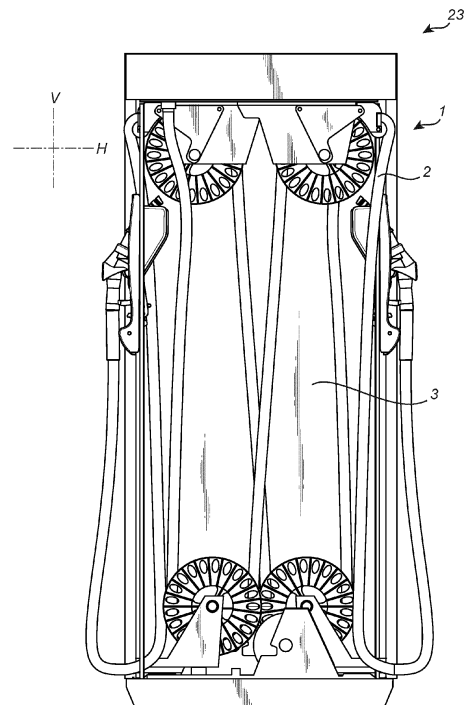


Fig. 1A

## Description

### Technical field

**[0001]** The invention relates to a device for handling a hose and a method for mounting of a hose handling device in a hose storage space of a fuel dispensing unit.

### 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 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 manoeuvring 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 column may be provided with some kind of returning mechanism for the hose.

**[0006]** US4131218 discloses hose returning means for a fuel dispensing unit. According to the embodiment shown in Fig. 11 the hose is connected to a fuel supply connection arranged inside the housing and passes a floatingly suspended roller which is connected to a wire reel. When the hose is pulled, the roller is lowered in order to make more hose available for the user.

**[0007]** WO00/15542 discloses a hose storing device in which a flexible hose is passed over a roller which is accommodated in a housing in such manner as to be movable against a return force in substantially vertical direction.

**[0008]** A problem common for the hose returning de-

vices described above is their size, or their extension within respective hose housings, which results in bulky and complicated structures.

### Summary of the invention

**[0009]** It is an object of the present invention to provide an improvement of the fuel dispensers according to prior art. A particular object is to provide improved fuel dispensing unit which is easy to mount.

**[0010]** According to a first aspect, these and other objects, and/or advantages that will be apparent from the following description of embodiments, are achieved, in full or at least in part, by a device for handling a hose, which device allows the hose to be pulled out from a front opening of a hose storage space and which device is adapted to return the hose to the hose storage space. The device comprises a first hose guiding means arranged in an upper section of the hose storage space, and a second hose guiding means arranged in a lower section of the hose storage space. The second hose guiding means is movably attached to a rear section of the hose storage space and adapted to move along the rear section in a vertical direction between an idle position in the lower section of the hose storage space and a working position in the upper section of the hose storage space to control the hose. The invention also related to a method for mounting of a hose handling device in a hose storage space of a fuel dispensing unit.

**[0011]** This is advantageous in that a robust and space-saving device is provided, which enables a smooth and flexible handling of the hose.

**[0012]** The hose may be adapted to extend, in a retracted state, from a hose connection in the upper section of the hose storage space, downwardly in the vertical direction, behind and below a roller of second hose guiding means, upwardly in the vertical direction, behind and above a roller of the first hose guiding means.

**[0013]** 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 roller which is arranged at a distance from the pivot axis and adapted to support the hose.

**[0014]** It enables to increase the hose length pulled outside the hose storage space and to reduce the frictions on the hose.

**[0015]** The rocker unit may comprise a side roller arranged in a vertical direction at each side of a hose opening thereof to facilitate side movements of the hose when pulled out from hose storage space.

**[0016]** The rocker unit may further comprise a front roller arranged in a horizontal direction to extend between the side rollers to lock the hose in place and facilitate movements of the hose when pulled out from hose storage space.

**[0017]** The front roller may be spring-loaded in a releasably manner to the rocker unit.

**[0018]** The first hose guiding means may be located at a front position of the hose storage space and the second hose guiding means is located at a rear position of the hose storage space.

**[0019]** The second hose guiding means may comprise a roller holding part which has two wheels adapted to travel in two corresponding grooves of the rear section of the hose storage space.

**[0020]** The rear section of the hose storage space may be constituted by a column adapted to define the hose storage space in a rear direction.

**[0021]** The column may be adapted to be clicked into place at a top part of the hose storage space by means of a locking mechanism.

**[0022]** Screws and bolts are usually used for fixing parts of a fuel dispenser of prior art. The invention enables a quick and easy mounting and dismounting of the column. The locking mechanism is made of only one piece, reducing the amount of part numbers.

**[0023]** According to a second aspect, the objects are achieved in full, or at least in part, by a method for mounting of a hose handling device in a hose storage space of a fuel dispensing unit. The method comprises arranging a first hose guiding means in an upper section of the hose storage space, arranging a roller holding part of a second hose guiding means in a lower section of the hose storage space, attaching a hose to the upper section of the hose storage space, extending the hose within the hose storage space, and arranging a roller in the roller holding part of the second hose guiding means.

**[0024]** The step of extending the hose within the hose storage space may comprise extending the hose from the upper section of the hose storage space, downwardly in the vertical direction, behind and below a roller axis of the roller holding part of second hose guiding means, and upwardly in the vertical direction, behind and above a roller of the first hose guiding means.

**[0025]** The step of attaching a hose to the upper section of the hose storage space may comprise arranging a first end of the hose to a hose connection, and arranging the hose connection to the upper section of the hose storage space above the first hose guiding means.

**[0026]** The method may further comprise the step of arranging a column to the hose storage space as a rear section thereof, such that the roller holding part of the second hose guiding means is in a movable engagement with the column and able to move along the column in a vertical direction between an idle position in the lower section of the hose storage space and a working position in the upper section of the hose storage space to control the hose.

**[0027]** The method may further comprise the step of arranging a front roller in the first hose guiding means to extend in a horizontal direction to lock the hose in place and facilitate movements of the hose when pulled out from hose storage space.

**[0028]** Normally, it is a quite difficult and tricky task to assembly a fuel dispensing unit when it comes to the

hose storage space and the device for handling the hose. The space for operating components and tools necessary to assembly the same is very limited. However, the specially developed components of the device for handling the hose described herein as well as the method described above for mounting of a hose handling device in a hose storage space of a fuel dispensing unit greatly simplifies the task for a person skilled in the art. Each component is especially developed to simplify the assembling and many of the components have some kind of plug-in solution.

**[0029]** It should be noted that the different embodiments of the device that is described above are exemplifying only. The embodiments may be combined with each other in any suitable way depending on the requirements established for the fuel dispenser.

**[0030]** It should be further noted that the different steps of the method described above may be conducted in any suitable order.

**[0031]** Effects and features of the second aspect of the present invention are largely analogous to those described above in connection with the first aspect the inventive concept. Embodiments mentioned in relation to the first aspect of the present invention are largely compatible with the further aspects of the invention.

**[0032]** Other objectives, features and advantages of the present invention will appear from the following detailed disclosure, from the attached claims, as well as from the drawings. It is noted that the invention relates to all possible combinations of features.

**[0033]** Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, step, etc.]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, step, etc., unless explicitly stated otherwise.

**[0034]** As used herein, the term "comprising" and variations of that term are not intended to exclude other additives, components, integers or steps.

#### Brief description of the drawings

**[0035]** 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. 1A illustrates a perspective view of an exemplary embodiment of a device for handling a hose according to a first aspect of the invention.

Fig. 1B illustrates a perspective view of an exemplary embodiment of primary components of the device in Fig. 1A.

Fig. 2A to 2J are perspective views of steps in a

method for mounting of a hose handling device in a hose storage space of a fuel dispensing unit according to a second aspect of the invention.

#### Detailed description of preferred embodiments of the invention

**[0036]** Fig. 1A illustrates an exemplary embodiment of a device 1 for handling a hose 2 in a hose storage space 3 of a fuel dispensing unit 23. There are normally several hoses 2 present in the hose storage space 3 and thus a corresponding amount of hose handling devices 1. The device 1 will be described in greater detail below.

**[0037]** The main purpose of the device 1 is to allow the hose 2 to be pulled out from a front opening of a hose storage space 3 during refuelling of a vehicle and thereafter return the hose 2 to the hose storage space 3. This will enhance the refuelling experience for the user since the hose 2 is controlled by the device 1 to avoid ending up on the ground and get stuck in or be damaged by passing cars or other vehicles.

**[0038]** In Fig. 1B, the primary components of the device 1 is illustrated. The device 1 comprises a first hose guiding means 4 arranged in an upper section of the hose storage space 3, and a second hose guiding means 5 arranged in a lower section of the hose storage space 3. The first hose guiding means 4 is located at a front position of the hose storage space 3 and the second hose guiding means 5 is located at a rear position of the hose storage space 3.

**[0039]** In this specific embodiment, the first hose guiding means 4 comprises a rocker unit 6 which, to allow pulling out and returning of the hose 2, is pivotable in relation to the hose storage space 3 about a pivot axis P and which comprises a roller 7 which is arranged at a distance from the pivot axis P and adapted to support the hose 2. The rocker unit 6 comprises a side roller 8 arranged in a vertical direction V at each side of a hose opening thereof to facilitate side movements of the hose 2 when pulled out from hose storage space 3. The rocker unit 6 further comprises a front roller 9 arranged in a horizontal direction H to extend between the side rollers 8 to lock the hose 2 in place and facilitate movements of the hose when pulled out from hose storage space 3. The front roller 9 is preferably spring-loaded in a releasably manner to the rocker unit 6 in order to facilitate mounting of the same.

**[0040]** At least a part of the second hose guiding means 5 is movably attached to an inner side of a column 10 of the hose storage space 3 and adapted to move along the inner side of the column 10 in a vertical direction V between an idle position in the lower section of the hose storage space 3 and a working position in the upper section of the hose storage space 3 to control the hose 2. The column 10 is adapted to be clicked into place at a top part of the hose storage space 3 by means of a locking mechanism 11, as illustrate in Fig. 2G. The locking mechanism 11 is made out of metal and comprises a horizontal

base plate from which four leg protrudes 20 vertically in a downwards direction. Two of these legs 20 are inclined at an angle of between 20° and 60° at an outer portion thereof. When the column 10 is clicked into place, the four legs of the locking mechanism 11 are passed through four openings 21 in the top part of the hose storage space 3 from above and interconnected with grooves 16 placed on an inner side of the column, thereby releasably fastening the column 10 to the top part of the hose storage space 3. Naturally, the number of legs and their exact configuration made be varied in any suitable manner. The same applies for the openings in the top part of the hose storage space 3.

**[0041]** A nozzle boot 12 is arranged on an outer side of the column. The second hose guiding means 5 comprises a roller holding part 13, holding a roller 14, which has two wheels 15 adapted to travel in the two corresponding grooves 16 of the inner side of the column 10 of the hose storage space 3, i.e. it is the roller holding part 13 that is movably attached to the inner side of the column 10 and thus movable together with the roller 14 in the vertical direction V between the idle position and the working position. The second hose guiding means 5 further comprises a retraction device 17 resiliently coupled to the second hose guiding means 5 in order to retract the roller holding part 13 of the second hose guiding means 5 from the working position back into the idle position within the hose storage space 3 when the refuelling process is completed. The retraction device 17 is fixedly arranged in the lower section of the hose storage space 3. The retraction device comprises a spring drum and a cord, wherein the cord is connected to the roller holding part 13.

**[0042]** The hose 2 is adapted to extend, in a retracted state, from a hose connection 18 in the upper section of the hose storage space 3, downwardly in the vertical direction, behind and below a roller of second hose guiding means, upwardly in the vertical direction, behind and above a roller of the first hose guiding means.

**[0043]** Fig. 2A to 2I illustrate different step in a method for mounting of a hose handling device 1 in a hose storage space 3 of a fuel dispensing unit 23. Naturally, the steps included in the method can be carried out in different suitable orders. One exemplary mounting method will, however, be described in greater detail below.

**[0044]** Initially, a shell of the fuel dispensing device 4 is provided (Fig. 2A). The hose storage space 3 is here provided with a bottom portion 18 and a top portion 19. A side wall 20 separating the hose storage space 3 from the hydraulics compartment 21 is also provided.

**[0045]** Thereafter, the first hose guiding means 4 is arranged in the upper section of the hose storage space 3 (Fig. 2B) and the second hose guiding means 5 — except for the roller 14 — is arranged in the lower section of the hose storage space 3 (Fig. 2C).

**[0046]** A first end of the hose 2 is attached to a hose connection 18, and the hose connection 18 is thereafter attached to the upper section of the hose storage space

3 above the top 19 of the same (Fig. 2D). The hose connection 18 is clicked into place by means of a locking device. Thereafter, a fuel line 22 is provided above the top 19 of the hose storage space 3 and connected to the hose connection 18 (Fig. 2E).

**[0047]** The column is thereafter attached to the lower section of the hose storage space 3 while being connected to the roller holding part 13 of the second hose guiding means 5 (Fig. 2F). More specifically, the two wheels 15 of the roller holding part 13 is connected to the two corresponding grooves 16 of the inner side of the column such that the roller holding part 13 can travel along the column in a vertical direction V thereof. Thereafter, the column 10 is clicked into place in the upper section of the hose storage space 3 and connected to the top 19 thereof by means of the locking mechanism 11 (Fig. 2G).

**[0048]** The roller 14 can now be placed in the roller holding part 13 of the second hose guiding means 5 in a manner such that the hose 2 extends from the upper section of the hose storage space 3, downwardly in the vertical direction V, behind and below a roller axis of the roller holding part 13 of second hose guiding means 5, and upwardly in the vertical direction V, behind and above the roller 7 of the first hose guiding means 4 (Fig. 2H).

**[0049]** Finally, the front roller 9 is arranged in the first hose guiding means 4 to extend in a horizontal direction H and lock the hose 2 into place (Fig. 2I). The front roller 9 is adapted to facilitate movements of the hose 2 when pulled out from hose storage space 3.

**[0050]** In Fig. 2J, the completed hose storage space 3 with the hose handling device 1 is illustrated.

**[0051]** When the hose 2 is pulled out from the hose storage space 3 by means of a pulling force applied by a user, the rocker unit 6 of the first hose guiding means 4 is pivoted about the pivoting axis P of the same to ensure that the hose 2 is pulled substantially horizontally out of the hose storage space 3 in order to minimize the friction between the hose 2 and the roller 7 of the first hose guiding means 4. The front roller 9 is pivoted towards the bottom of the fuel dispenser and thus towards the second hose guiding means 5. Further, the roller holding part 13 of the second hose guiding means 5 will travel upwardly in a vertical direction V along the inner side of the column 10 as a consequence of the hose 2 being pulled out of the hose storage space 3, thereby placing the second hose guiding means 5 in a working position during refuelling of a vehicle.

**[0052]** When the refuelling process is completed, and the pulling force applied to the hose 2 by a user is neutralised, the retraction device 17 will retract the second hose guiding means 5 from the working position back to the idle position within the hose storage space 3, whereas the hose 2 will be pulled back into the hose storage space 3.

**[0053]** 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.

**[0054]** As stated above, it is imported to understand that the different method steps may be conducted in any suitable order and that the detailed description of the method presented above is of exemplary nature only.

## Claims

1. A device (1) for handling a hose (2), which device (1) allows the hose (2) to be pulled out from a front opening of a hose storage space (3) and which device (1) is adapted to return the hose (2) to the hose storage space (3), the device (1) comprising:

a first hose guiding means (4) arranged in an upper section of the hose storage space (3), and a second hose guiding means (5) arranged in a lower section of the hose storage space (3), wherein at least a part of the second hose guiding means (5) is movably attached to a rear section of the hose storage space (3) and adapted to move along the rear section in a vertical direction (V) between an idle position in the lower section of the hose storage space (3) and a working position in the upper section of the hose storage space (3) to control the hose (2).

2. The device (1) according to claim 1, wherein the hose (2) is adapted to extend, in a retracted state, from a hose connection (18) in the upper section of the hose storage space (3), downwardly in the vertical direction (V), behind and below a roller (14) of second hose guiding means (5), upwardly in the vertical direction (V), behind and above a roller (7) of the first hose guiding means (4).

3. The device (1) according to claim 1 or 2, wherein the first hose guiding means (4) comprises a rocker unit (6) which, to allow pulling out and returning of the hose (2), is pivotable in relation to the hose storage space (3) about a pivot axis (P) and which comprises a roller (7) which is arranged at a distance from the pivot axis (P) and adapted to support the hose (2).

4. The device (1) according to claim 3, wherein the rocker unit (6) comprises a side roller (8) arranged in a vertical direction (V) at each side of a hose opening thereof to facilitate side movements of the hose (2) when pulled out from hose storage space (3).

5. The device (1) according to claim 4, wherein the rocker unit (6) further comprises a front roller (9) arranged in a horizontal direction (H) to extend between the side rollers (8) to lock the hose (2) in place and facilitate movements of the hose (2) when pulled out from hose storage space (3).

6. The device (1) according to claim 5, wherein the front

roller (9) is spring-loaded in a releasably manner to the rocker unit (6).

7. The device (1) according to any one of the preceding claims,  
wherein the first hose guiding means (4) is located at a front position of the hose storage space (3) and the second hose guiding means (5) is located at a rear position of the hose storage space (3).
8. The device (1) according to any one of the preceding claims,  
wherein second hose guiding means (5) comprises a roller holding part (13) which has two wheels (15) adapted to travel in two corresponding grooves (16) of the rear section of the hose storage space (3).
9. The device (1) according to any one of the preceding claims,  
wherein the rear section of the hose storage space (3) is constituted by a column (10) adapted to define the hose storage space (3) in a rear direction.
10. The device (1) according to claim 9, wherein the column (10) is adapted to be clicked into place at a top part (19) of the hose storage space (3) by means of a locking mechanism (11).
11. A method for mounting of a hose handling device (1) in a hose storage space (3) of a fuel dispensing unit (23), comprising:  
  
arranging a first hose guiding means (4) in an upper section of the hose storage space (3),  
arranging a roller holding part (13) of a second hose guiding means (5) in a lower section of the hose storage space (3),  
attaching a hose (2) to the upper section of the hose storage space (3),  
extending the hose (2) within the hose storage space (3), and  
arranging a roller (14) in the roller holding part (13) of the second hose guiding means (5).
12. The method according to claim 11, wherein the step of extending the hose (2) within the hose storage space (3) comprises extending the hose (2) from the upper section of the hose storage space (3), downwardly in the vertical direction (V), behind and below a roller axis (A) of the roller holding part (13) of second hose guiding means (5), and upwardly in the vertical direction (V), behind and above a roller (7) of the first hose guiding means (4).
13. The method according to claim 11 or 12, wherein the step of attaching a hose (2) to the upper section of the hose storage space (3) comprises:

arranging a first end of the hose (2) to a hose connection (18), and  
arranging the hose connection (18) to the upper section of the hose storage space (3) above the first hose guiding means (4).

14. The method according to any one of the claims 11 to 13, further comprising the step of arranging a column (10) to the hose storage space (3) as a rear section thereof, such that the roller holding part (13) of the second hose guiding means (5) is in a movable engagement with the column (10) and able to move along the column (10) in a vertical direction (V) between an idle position in the lower section of the hose storage space (3) and a working position in the upper section of the hose storage space (3) to control the hose (2).
15. The method according to any one of the claims 11 to 14, further comprising the step of arranging a front roller (9) in the first hose guiding means (4) to extend in a horizontal direction (H) to lock the hose (2) in place and facilitate movements of the hose (2) when pulled out from hose storage space (3).

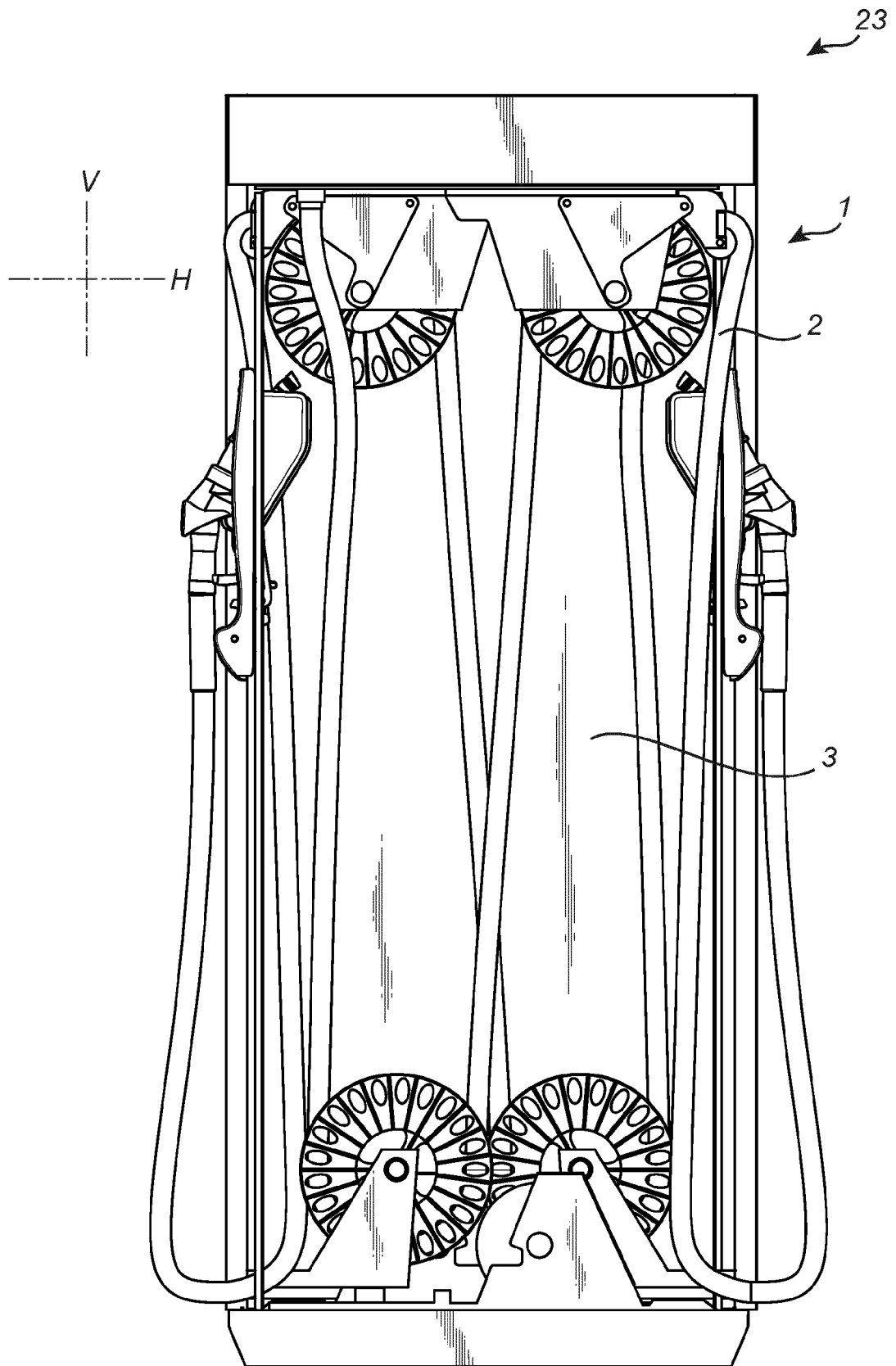


Fig. 1A

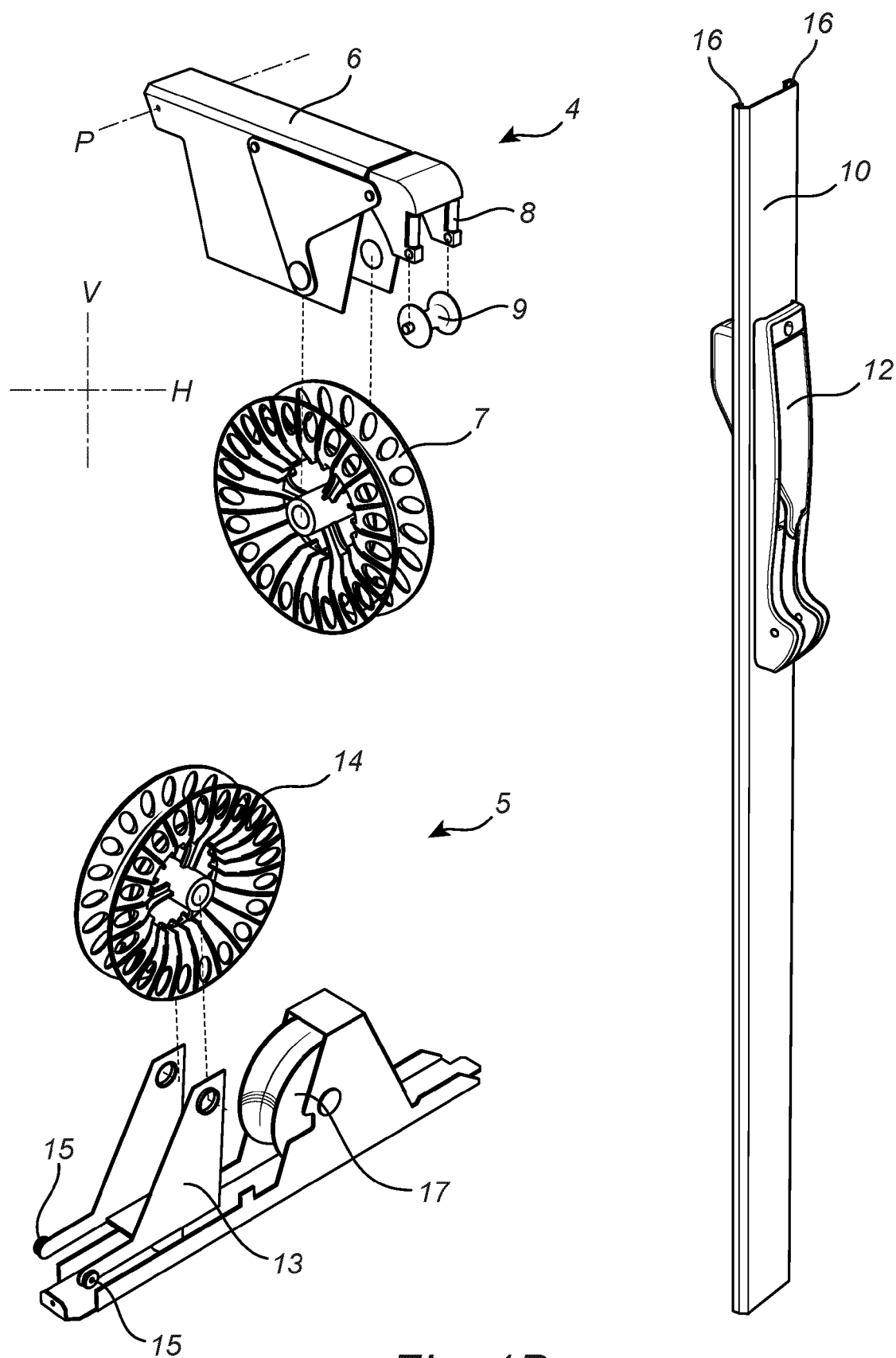
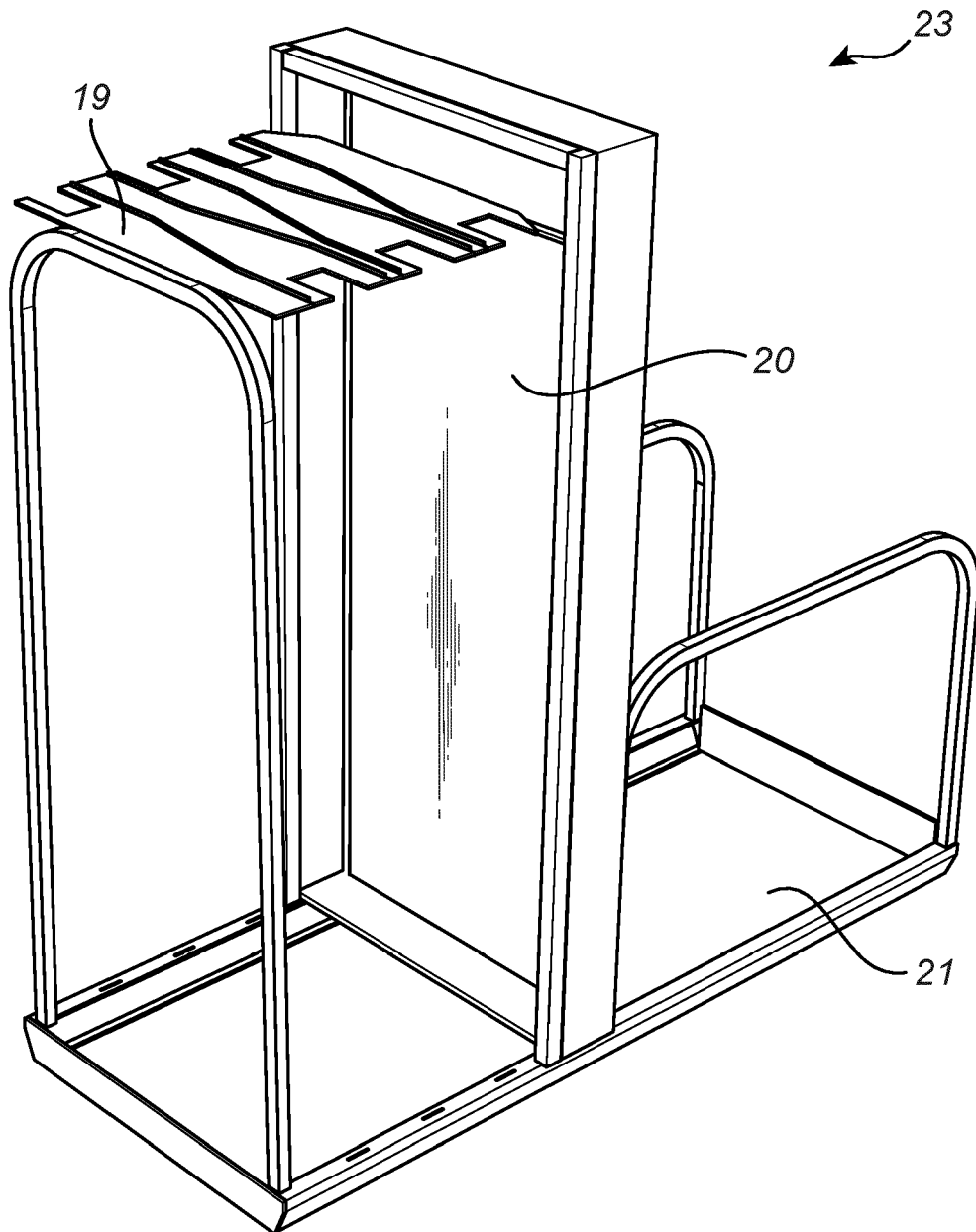
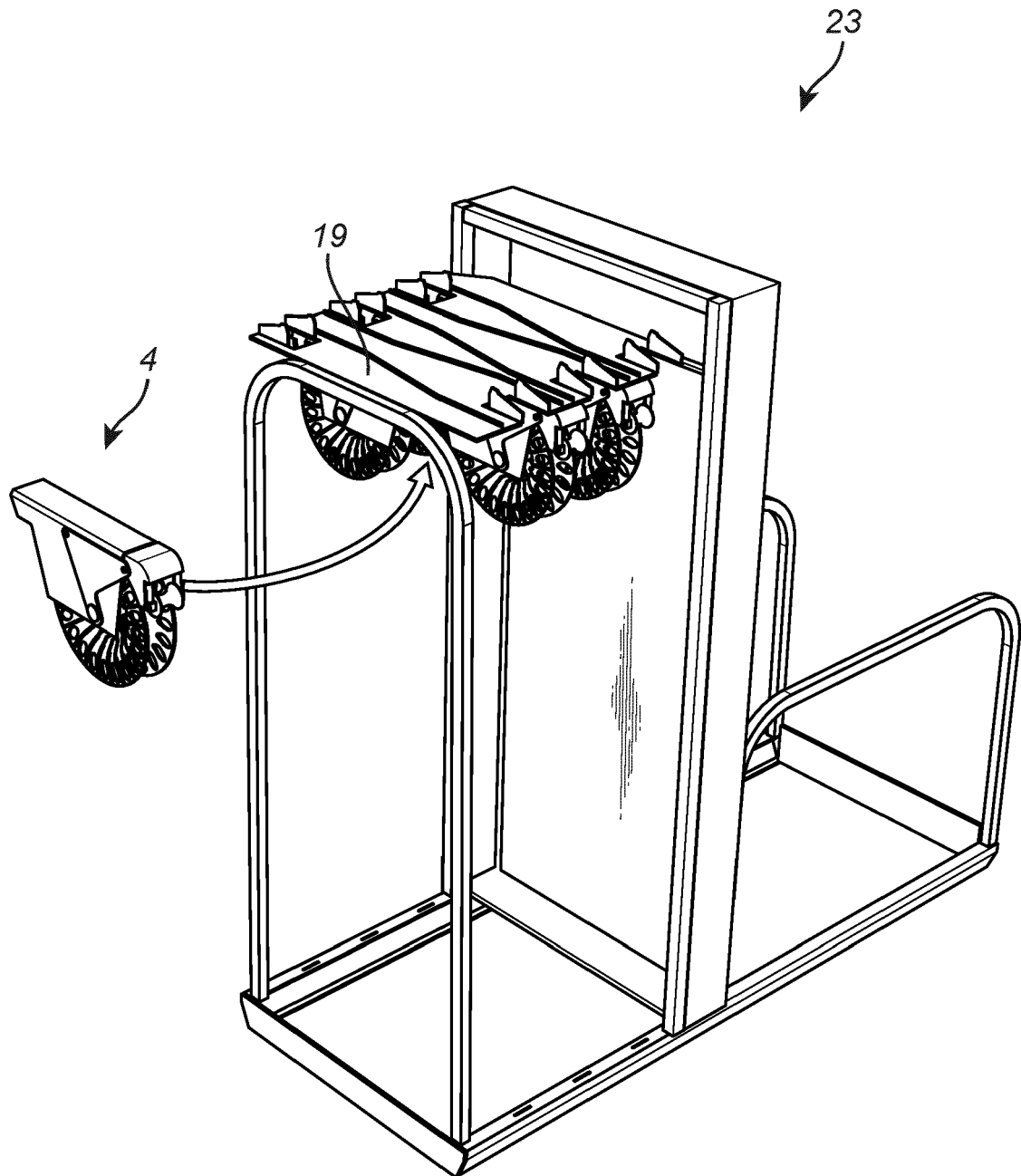


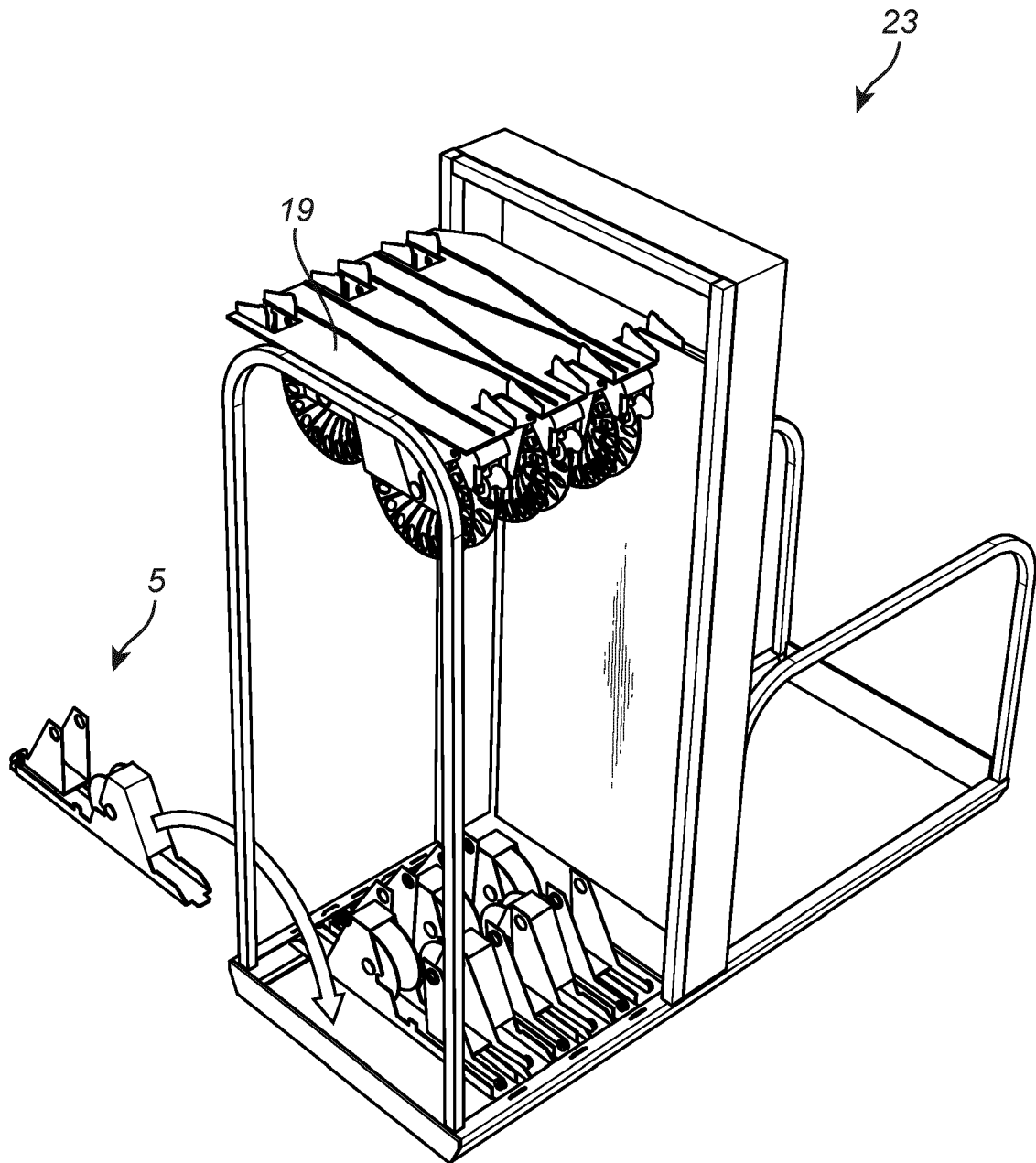
Fig. 1B



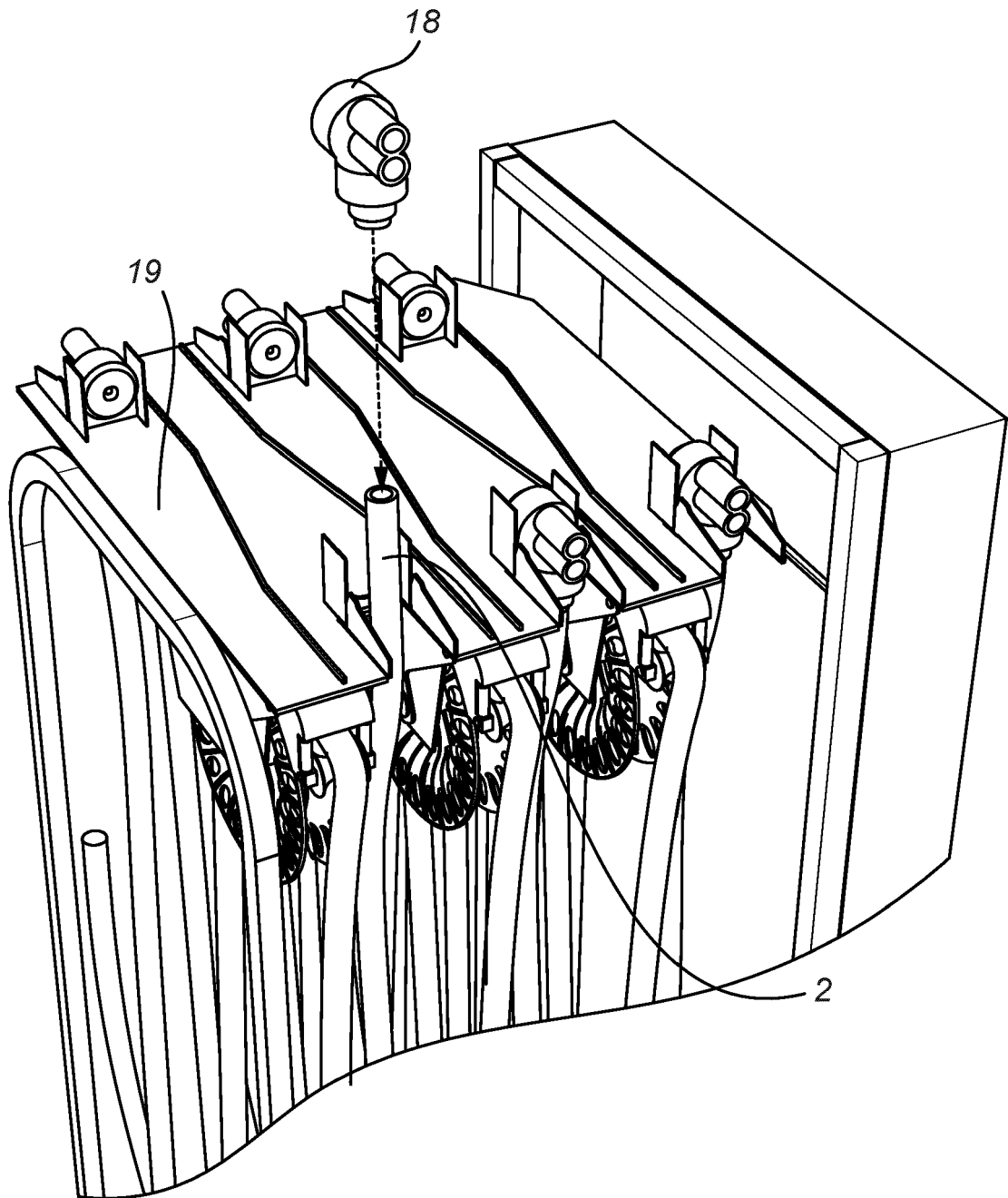
*Fig. 2A*



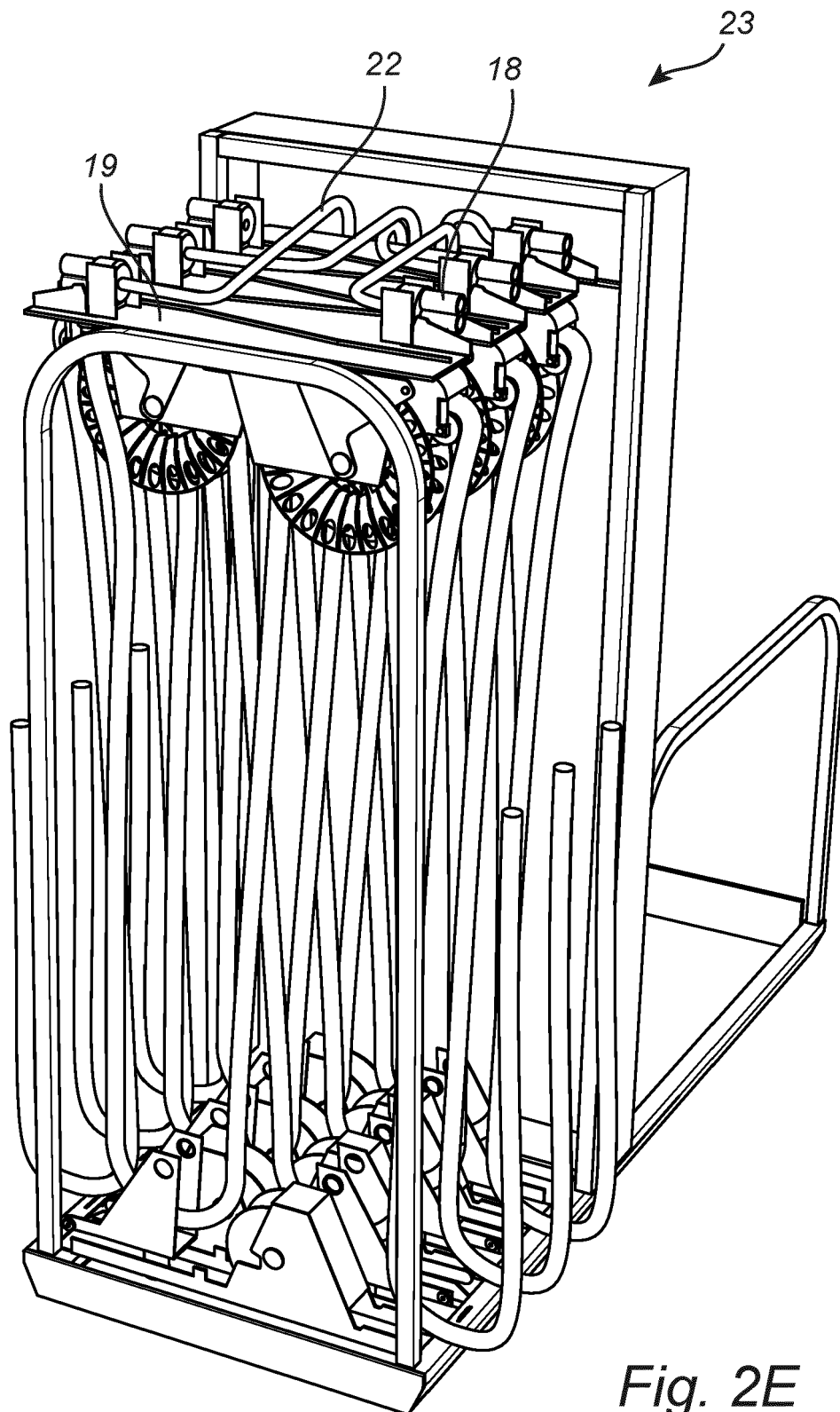
*Fig. 2B*



*Fig. 2C*



*Fig. 2D*



*Fig. 2E*

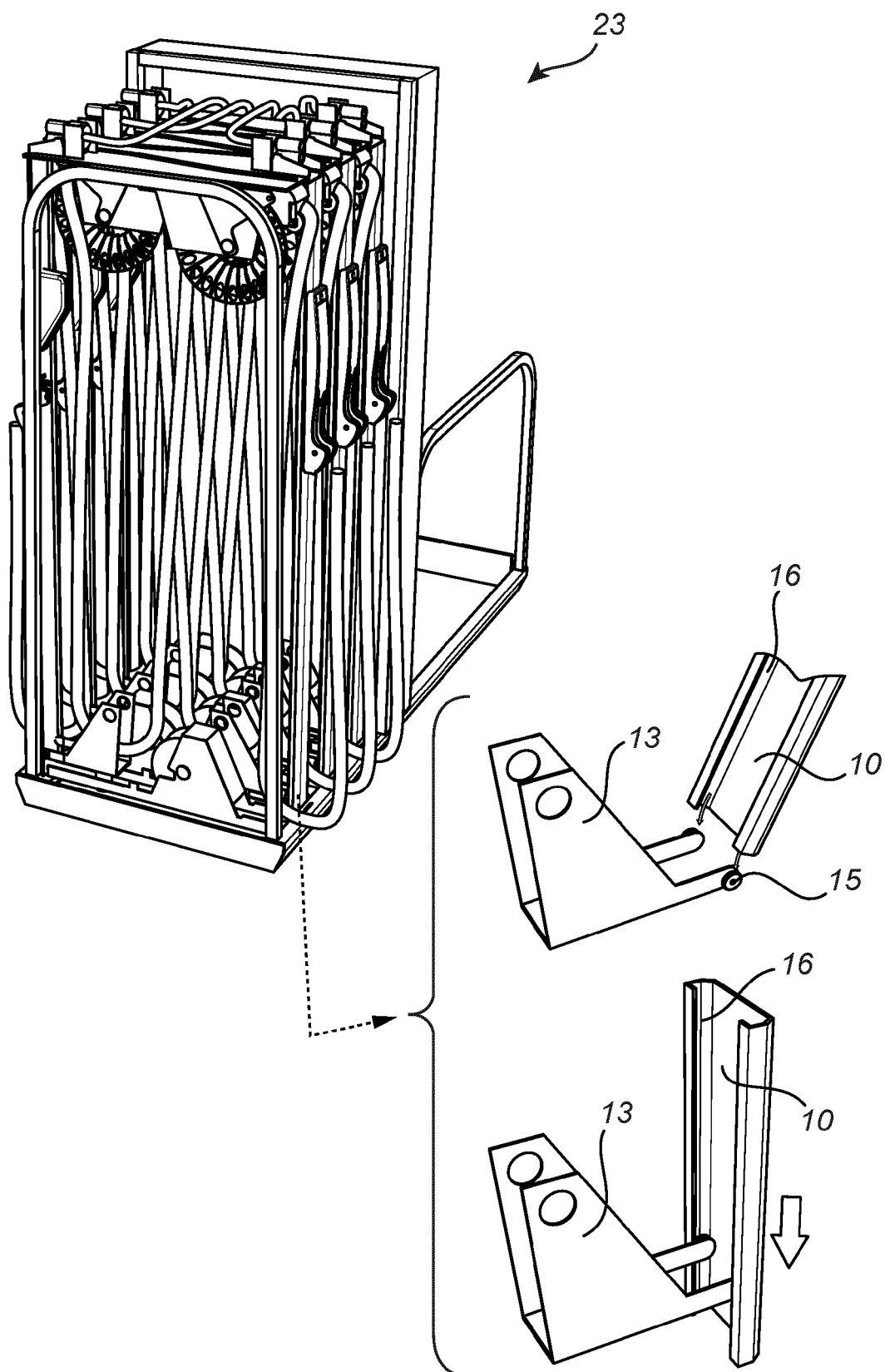


Fig. 2F

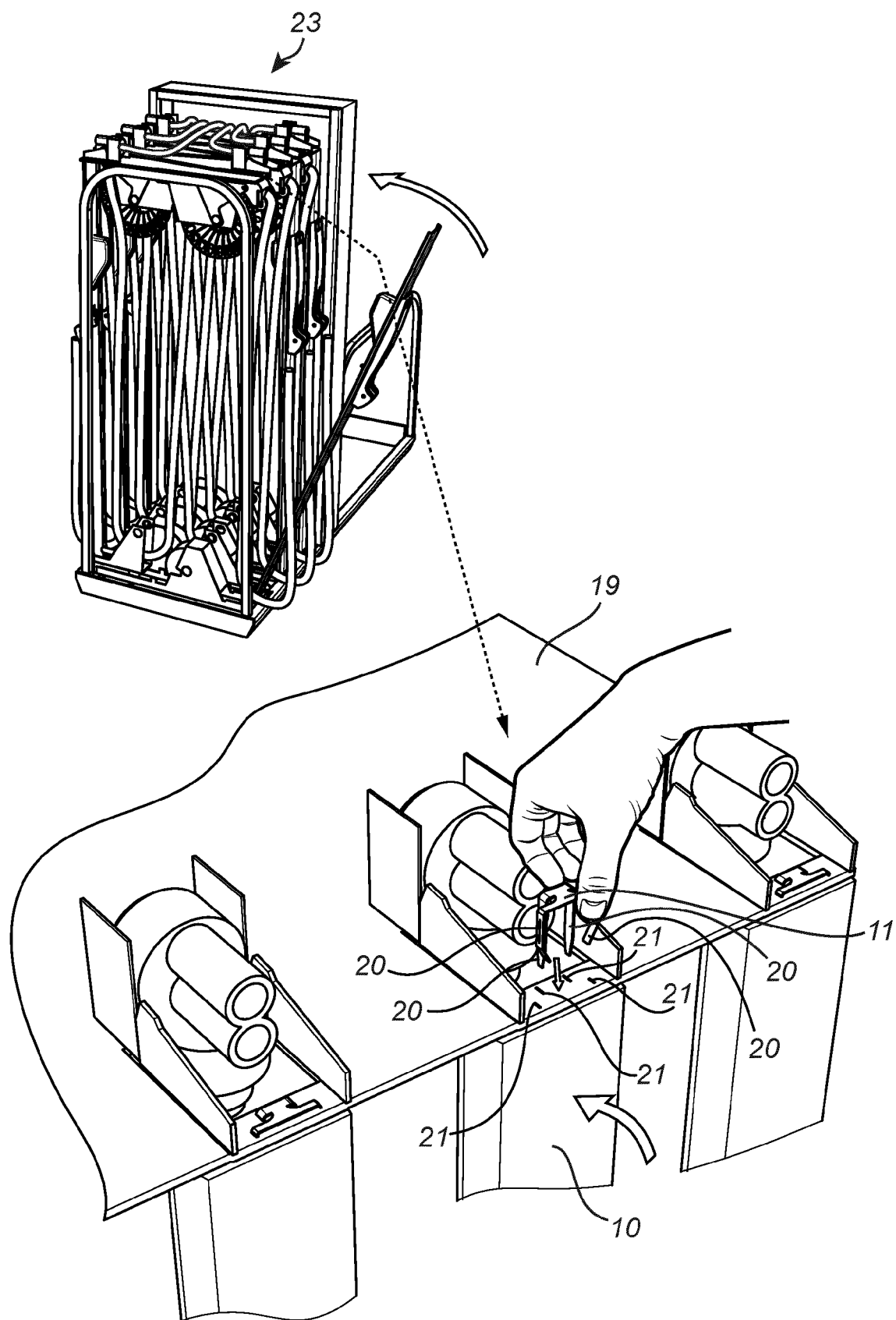


Fig. 2G

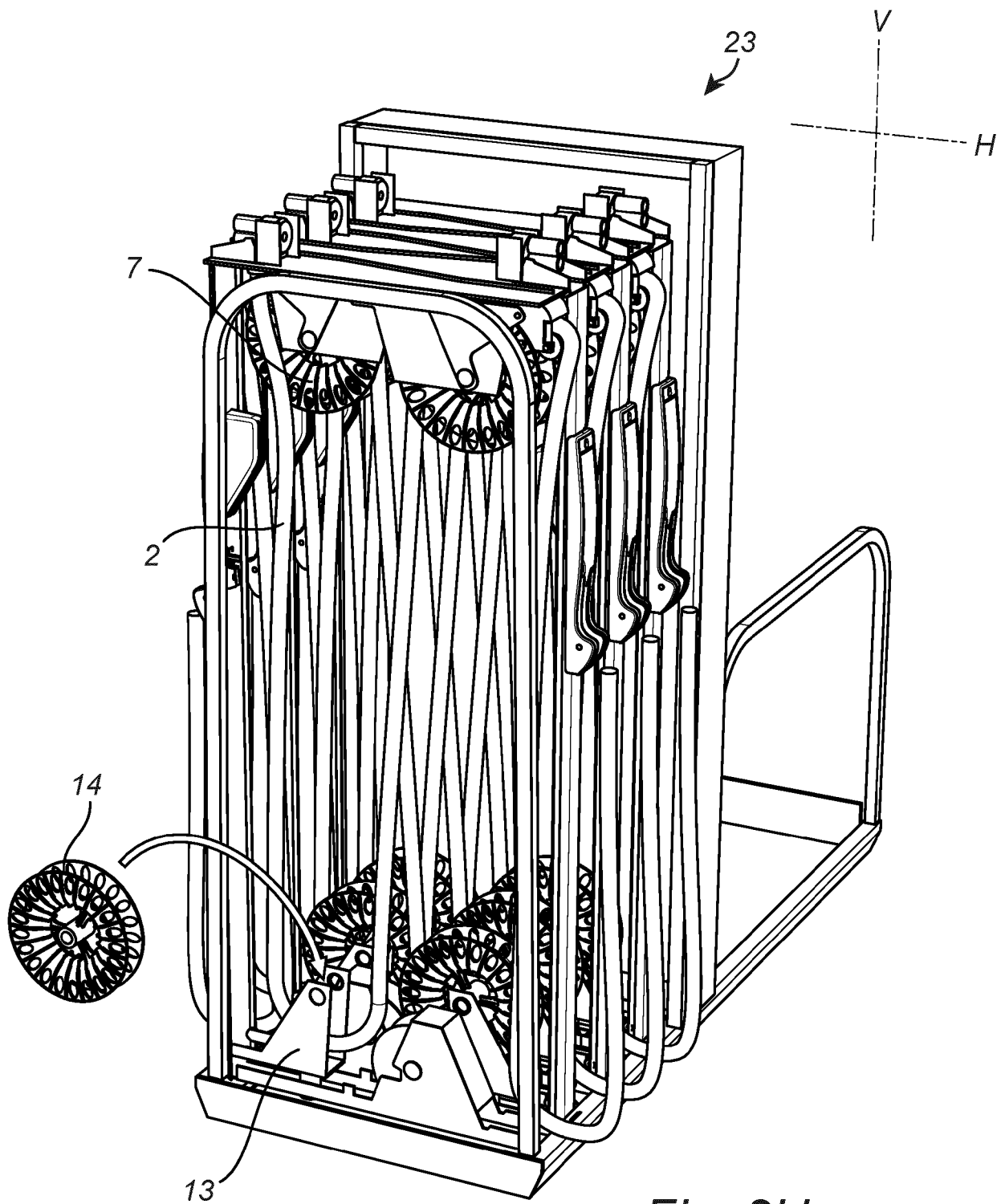
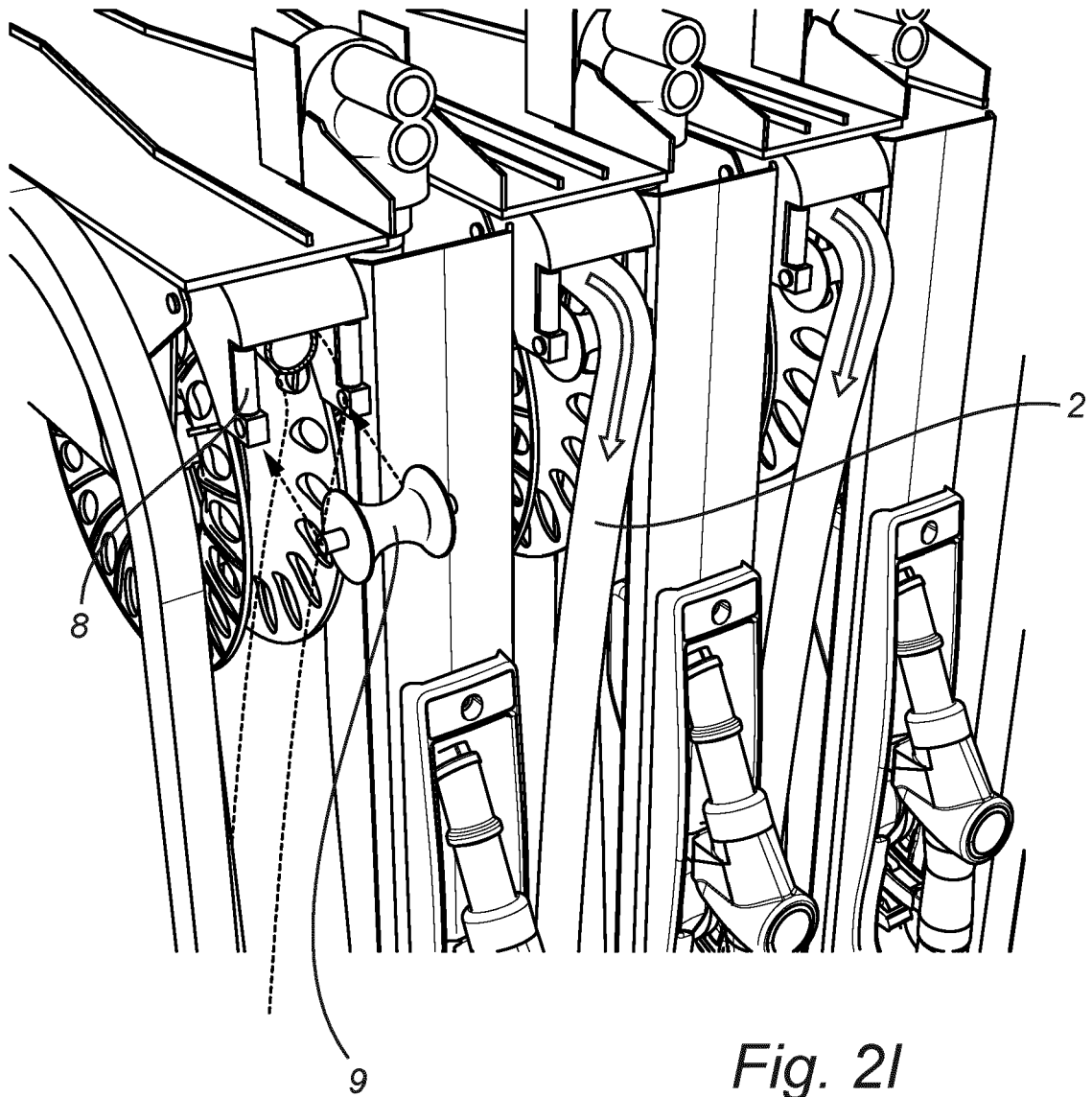
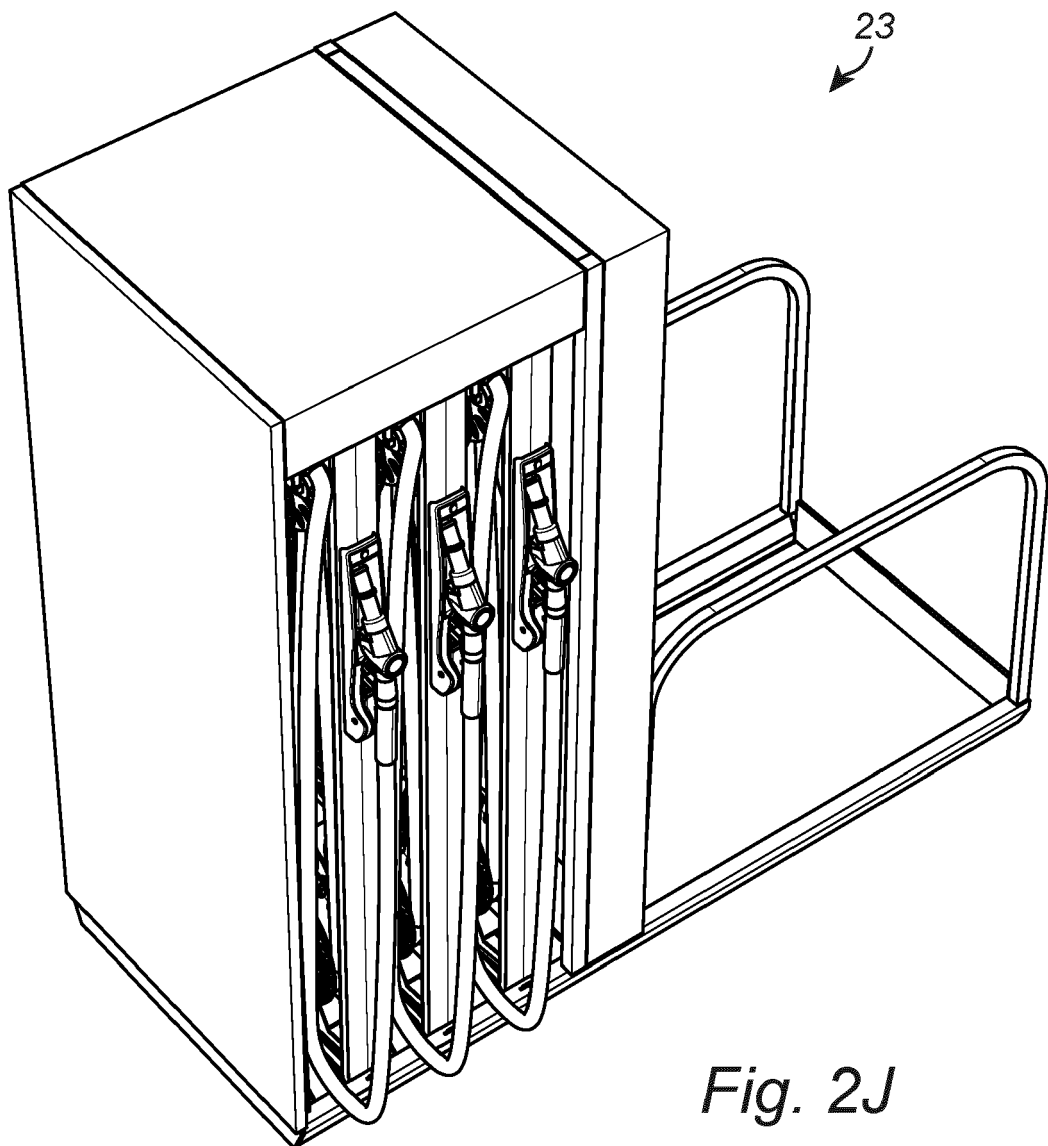


Fig. 2H



*Fig. 21*





## EUROPEAN SEARCH REPORT

Application Number

EP 21 20 3471

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EPO FORM 1503 03.82 (P04C01)

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                  |                                                      |                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                                    | Relevant to claim                                    | CLASSIFICATION OF THE APPLICATION (IPC) |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2 944 748 A (CARNAGUA HAROLD E ET AL)<br>12 July 1960 (1960-07-12)                                                                                                            | 1, 7, 9, 10                                          | INV.<br>B67D7/04                        |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | * column 1, line 15 - line 23 *<br>* column 1, line 45 - line 72 *<br>* column 4, line 7 - column 5, line 70;<br>figures 1, 2, 4, 7 *                                            | 2-6, 8,<br>14, 15                                    | B67D7/40<br>B67D7/84                    |
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