



(12) APPLICATION

(11) 20180255

(13) A1

NORWAY

(19) NO

(51) Int Cl.

B65H 49/28 (2006.01)

B65H 49/30 (2006.01)

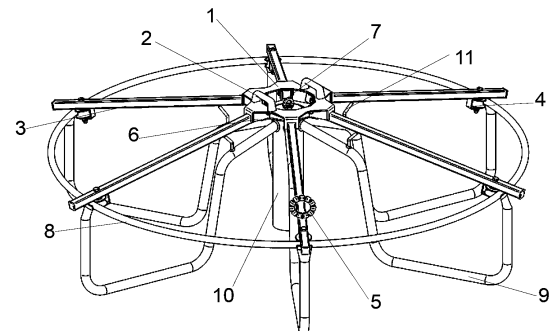
B65H 49/24 (2006.01)

Norwegian Industrial Property Office

(21)	Application nr	20180255	(86)	Int. application day and application nr
(22)	Application day	2018.02.19	(85)	Entry into national phase
(24)	Date from which the industrial right has effect	2018.02.19	(30)	Priority
(41)	Available to the public	2019.05.06		
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(54) Title **A device for feeding flexible pipes**
(57) Abstract

Device and method for feeding of flexible pipes characterised in that it comprises an upper part and a lower part wherein the upper part can be placed on top of the lower part, the upper part comprises a central portion (1), this central portion (1) has an opening in the centre, at least two bars are attached to the central portion (1), these bars extend outwards from the central portion (1), there is attached a wheel or a roller (4) to each of the bars, these wheels or rollers (4) can rotate and rests against a rim (8) on the lower part of the device when the upper part of the device is placed on top of the lower part of the device, a guide (5) for the flexible pipe is attached to the top of at least one of the bars, the lower part comprises a central hub (10), a lifting arrangement (7) is attached to the top of the central hub (10), a second set of bars (9) is attached at one end to the central hub (10), wherein the bars has a first and a second portion, the first portion extending outwards from the central hub (10) and the second portion are U-shaped, the U-shaped portion creates a cradle in which the flexible pipes rests, the second set of bars (9), are at a second end, attached to the rim (8) of the lower part of the device.



Technical field

The present invention regards a device and method for feeding of flexible coils, and more particularly a device and method for feeding of flexible coils like e.g. flexible pipes.

5 Background of the Invention

Flexible pipes have many uses, in modern houses and buildings flexible pipes are e.g. used as water pipes for the main water supply to the house.

The way this is done today are by uncoiling a length of pipe, stretching it out and laying it into a ditch before connecting it to the main water supply. This is a very
 10 time consuming and costly way of working since it requires two or more people uncoiling and laying the pipe. It can also be very heavy and dirty work since working in a ditch when it is raining is not very pleasant.

A known solution to this problem is a U-shaped device onto which the coil of pipe is placed and the device and the coil are hoisted into the air using e.g. a digger or
 15 other large and heavy equipment.

The problem with this solution is that it is mostly suited for larger sizes of pipes and it also requires large and heavy equipment which is expensive, requires personnel which can operate this type of equipment and roads that can transport equipment of this size.

20 Further this solution is only suited when rolling out pipes, rolling it in again is not possible.

US 4949909 A is an example of an alternative solution. Here it is presented a pipe coil rack for dispensing pipes from a coil. The device is a frame having a turntable bearing, a cross bar, legs, wheels and a tongue. A turntable is rotatably mounted to
 25 the turntable bearing. Further a pipe guide ring is secured to the frame. The turntable includes a pipe reel hold down assembly secured to the turntable with a rubber strap and spacers removably secured to the turntable and to the pipe reel hold down assembly. The pipe coil dispensing rack may be positioned for use horizontally by positioning the wheels and the tongue on the ground, or the pipe
 30 coil dispensing rack may be positioned for storage vertically by positioning wheels and the cross bar on the ground.

This solution has several drawbacks. A drawback is that it has to be placed on the ground when dispensing the pipe, since it is not possible to hoist it into the air. A

further problem is the open solution of the invention, wherein the coil of pipe is not securely positioned. Even further, as stated in the application a form of engine is needed in order to uncoil the pipes.

The loading of the pipe is also very complicated in this solution.

- 5 There are also a lot of solutions for smaller hoses and wires, but these solutions are not scalable since the loading of the devices are estimated as being doable for one person. The coils of wire or hoses can easily be lifted and handled by one person.

Summary of the Invention

- 10 It is therefore an object of the present invention, as stated in the set of claims to overcome the problems mentioned above.

The present invention is a device comprising of two parts. There is an upper and a lower part. The upper part has two functions wherein one of them is to function as a lid securing the flexible coils. The other function is to work as a guide 5 for the flexible coils.

- 15 The lower part of the device functions as a cradle for the flexible coils. When the upper part is off, the flexible coils is placed in the cradle portion of the lower part. The cradle is attached to a central hub 10. The central hub 10 can be a hollow tube. On top of the central portion 1 there is a plate. Through this plate there is attached swivel. To this swivel there is attached a lifting arrangement 7. This lifting
20 arrangement 7 can be a ring from which the entire device can be hoisted. The swivel makes it possible for the lower part of the device to rotate freely in either direction relative to the lifting arrangement 7 and the upper part of the device.

- When the upper part of the device is placed on top of the lower part of the device the e.g. coil of flexible pipe can be guided through the guide 5 for the pipe which is
25 placed on top of the upper part. By pulling on the pipe the bottom part of the device rotates while the upper part stays in place.

- Since the cradle of the lower part can rotate freely in either direction while the upper part works as a guide 5 for the pipe the present invention can be operated by a single person. He or she can pull out as much pipe as needed without having to
30 uncoil it first. Further since the cradle can rotate in either direction it is also possible to push the pipe in again if needed.

As an alternative solution the device can also be placed on a rack or a stand. The rack is placed on the ground or a floor. The rack has a central spindle 12 which fits

into an opening in the bottom of the central hub 10. The spindle 12 connects with the central hub 10. This allows the cradle to function as a turntable. A benefit with this solution is that the device can be operated without the use of heavy equipment for hoisting the device up in the air.

- 5 Further this rack can have several levels which allows for stacking more than one device. By doing this e.g. pipes of more than one dimension can be available at one time.

Brief description of the drawings

10 Figure 1 is a perspective view of an embodiment of the upper part of the present invention.

Figure 2 is a perspective view of an embodiment of the lower part of the present invention.

Figure 3 is a perspective view of the combination of the upper and lower part of the present invention.

- 15 Figure 4 is a cross sectional view of an alternative solution to the present invention with the flexible pipes placed in the lower part of the present invention.

Figure 5 is a top view of the alternative solution presented in figure 4.

Figure 6 is a perspective view of a stand for the solution presented in figure 3.

- 20 Figure 7 is a perspective view of the present invention placed on the stand presented in figure 6.

Figure 8 is a perspective view of a stand with the capability to store three units of the present invention.

Figure 9 is a perspective view of three units of the present invention placed in the stand presented in figure 8.

25 Detailed description

- Figure 1 is a perspective view of an embodiment of the upper part of the present invention. The upper part comprises a central portion 1. The central portion 1 has an opening in the middle. This opening allows access to the central hub 10 of the lower part of the device. A pair of handles 2 is attached on top of the central
30 portion 1. These handles 2 are for lifting the upper part.

A set of bars 3 are attached to the central portion 1. These bars 3 extend outwards from the central portion 1. The number of bars 3 attached to the central portion 1 can vary, but there must be at least three. The bars 3 can extend further out than the rim 8 of the lower part.

- 5 There is attached a wheel or a roller 4 to each of the bars 3. These wheels or rollers 4 rotate and rest against the rim 8 of the lower part of the device. These wheels or rollers 4 are the only contact point between the upper and the lower part of the device. The rollers 4 can have a U- or V-shaped groove that fits against the rim 8.

- 10 A guide 5 is attached to at least one of the bars 3. This guide 5 is in the form of a circle. The pipe is guided through this guide 5. Rollers 4 can be fitted on this guide 5 in order to ensure that the pipe passes easier through the guide 5.

- The bars 3 can be hinged 6 at the attachment point to the central portion 1. This allows for the rollers 4 to be pressed against the rim 8 of the lower part of the device. The movement of the bars 3 can from 5° - 90° . More preferably 5° - 30°
15 and most preferably 10° - 20° .

- Figure 2 is a perspective view of an embodiment of the lower part of the present invention. The lower part comprises a central hub 10. The central hub 10 can be a hollow tube. On top of the central portion 1 there is a plate. Through this plate there is attached swivel. To this swivel there is attached a lifting arrangement 7.
20 This lifting arrangement 7 can be a ring from which the entire device can be hoisted. The swivel makes it possible for the lower part of the device to rotate freely in either direction relative to the lifting arrangement 7 and the upper part of the device.

- As an alternative embodiment the lifting arrangement 7 lifting arrangement 7 can
25 be connected to the central hub 10 via a set of ball bearings. This will also allow the lower part of the device to rotate freely in either direction independently of the upper part of the device.

- To the outside of the central hub 10 there is attached a second set of bars 9. These second set bars are, at one end, attached to the upper part of the outside of the
30 central hub 10. The first part of the second set of bars 9 extends outwards from the central hub 10. They can also be slanting slightly downwards. The second part of the second set of bars 9 are U-shaped. The second end of the second set of bars 9 are attached to a circular bar, herein after called the rim 8. The number of the second set of bars 9 in the lower part of the device can vary, but there must be at
35 least two.

The second set of bars 9 create a cradle. The coil of flexible pipe is placed in this cradle. As the first part of the second set of bars 9 extend outwards from the central hub 10 before they create a U-shaped cradle, they ensure that the coil of flexible pipes do not shift while it is placed in the device.

- 5 As an alternative embodiment the central hub 10 could have a wider circumference and the second set of bars 9 could be attached to the bottom part of the outer portion of the central hub 10. The second set of bars 9 could then have an L-shape.

As an even further alternative embodiment, the second set of bars 9 could be replaced with e.g. sheet metal, or similar material creating the cradle.

- 10 To the first part of each of the second set of bars 9 there is attached a stopper 11. This stopper 11 extends upward to ensure that the flexible pipe do not wedge itself between the upper and the lower part of the device. These stoppers 11 can be bars or they can e.g. be wheels or rollers 4.

- The central hub 10 has a top portion onto which there is attached a lifting
15 arrangement 7. This lifting arrangement 7 can be a ring from which the entire device can be hoisted.

- Figure 3 is a perspective view of an embodiment of the entire device of the present invention. In this figure the upper part of the device is placed on top of the lower part of the device. Here it can be seen that the roller 4 on the bars of the upper
20 part of the device rests against the rim 8 of the lower part. In a preferred embodiment of the present invention, this is the only places of contact between the upper and the lower part of the device.

- Figure 4 is a cross sectional view of an alternative embodiment of the present invention with the flexible pipes 18 placed in the lower part of the device. The
25 flexible pipes 18 are guided from the lower part of the device between two bars 3 of the upper part of the device and through the guide 5 shown in figure 1 and 3. The device can be either placed on a stand or hoisted into the air by the lifting arrangement 7. The device is now ready for use.

- When the device is ready for use a user can pull on the piece of pipe guided
30 through the guide 5. The bottom part of the device will start to rotate while the upper part of the device will be held in place by the pipe. The rollers 4 and either the swivel or the bearings in the stand 12 will ensure that the bottom part rotates easily relative to the upper part.

If the user pushes on the flexible pipe 18 while holding the upper part, the bottom part of the device will rotate in the opposite direction and the pipe will be fed into the device.

It is further shown in this embodiment of the present invention that the central hub
5 10 is shorter. This has no effect on how the device operates.

Figure 5 is a top view of the alternative embodiment presented in figure 4. Here it is shown that the pipe 18 is guided between two bars 3 of the upper part of the device and through a guide 5 attached on top of one of the bars 3 of the upper part of the device.

10 Figure 6 is a perspective view of a stand for the embodiment presented in figure 3. As shown the stand has a set of feet 13 extending outwards from a centre. The feet 13 extend outwards in different directions to give a firm base that is stable in all directions. The number of feet 13 can vary from three and upwards. At the centre there is a spindle 12. The central hub 10 attaches to this spindle 12.

15 As a solution the spindle 12 can rotate freely in either direction independent of the feet 13 of the stand. In this embodiment the outer part of the central hub 10 of the lower part of the device is in rests on the spindle 12.

In an alternative embodiment the spindle 12 connects to the central hub 10 and thus allows the lower part of the device to rotate freely in either direction relative to
20 the upper part of the device and the stand.

Figure 7 is a perspective view of the present invention placed on the stand presented in figure 6. Here it is seen how the central hub 10 of the lower part of the device is placed on the spindle 12 of the stand.

Figure 8 is a perspective view of a stand with the capability to store three units of
25 the present invention. In this embodiment the stand has the capability to store three units of the device. The stand has a set of feet 15, 16 ensuring stability. To the end of one of the feet 15 there is attached a first leg 17. This leg extends upwards 17. To this leg 17 there are attached a second and third leg 14. These legs extend outwards from the first leg 17. The second and third legs 14 are placed
30 above each other. The distance between the second and third leg 14 allows a unit of the present invention to be placed between them. To the end of the second and third leg 14 there are placed a spindle 12 like the one described in figure 6.

Figure 9 is a perspective view of three units of the present invention placed in the stand presented in figure 8.

Claims

1. A device for feeding of flexible pipes c h a r a c t e r i s e d i n that it comprises an upper part and a lower part wherein the upper part can be placed on top of the lower part, the upper part comprises a central portion (1), at least three bars (3) are attached to the central portion (1), these bars (3) extend outwards from the central portion (1), the bars (3) are hinged (6) at the attachment point, there is attached a wheel or a roller (4) to each of the bars (3), a guiding ring for the flexible pipe is attached to the top of at least one of the bars (3), the lower part comprises a central hub (10), the central hub (10) has a top plate, to this top plate there is attached a lifting arrangement (7), this lifting arrangement (7) is attached to a swivel, this swivel allows the lower part of the device to rotate freely in either direction relative to the upper part of the device, and the lifting arrangement (7), a second set of bars (9) is attached at one end to the central hub (10), wherein the bars has a first and a second portion, the first portion extends outwards from the central hub (10) and the second portion are U-shaped, the U-shaped portions of the second set of bars (9) creates a cradle in which the flexible pipes rests, the second set of bars (9), are at a second end, attached to the rim (8) of the lower part of the device.
2. A device according to claim 1 wherein the central portion (1) has an opening in the centre allowing access to the lifting arrangement (7) on the top of the central hub (10) of the lower part of the device.
3. A device according to claim 1 wherein the central portion (1) has a set of handles (2) for lifting the upper part of the device.
4. A device according to claim 1 wherein the upper part of the device is held in place on top of the lower part of the device by gravity pushing the rollers (4) against the rim (8).
5. A device according to claim 1 wherein the rollers (4) can have a U- or V-shaped groove that fits against the rim (8).
6. A device according to claim 1 wherein the bars (3) attached to the central portion (1) can be hinged (6) at the attachment point.
7. A device according to claim 1 wherein the movement of the bars (3) can from 5° - 90°. More preferably 5° - 30° and most preferably 10° - 20°.

8. A device according to claim 1 wherein the weight of the upper part of the device locks it in place when used is placed on the lower part of the device.
9. A device according to claim 1 wherein the wheels or rollers (4) can rotate and rests against a rim (8) on the lower part of the device when the upper part of the device is placed on top of the lower part of the device.
10. A device according to claim 1 wherein the second set of bars (9) can be replaced with panels of sheet metal.
11. A device according to claim 1 wherein each of the second set of bars (9) has a stopper (11) attached to it to prevent the flexible pipe from wedging between the upper and the lower part of the device.
12. A device according to claim 1 wherein the upper part of the device and the lower part of the device are in contact with each other via the wheels or rollers (4) resting on the rim (8) of the lower part of the device.
13. A device according to claim 1 wherein said device can be placed on a stand wherein the stand has a spindle (12) that the central hub (10) is placed upon.
14. A device according to claim 1 wherein the spindle (12) can be attached to the rest of the stand via a set of bearings allowing it to rotate freely in either direction.
15. A method for feeding of flexible pipes c h a r a c t e r i s e d i n that it comprises an upper part and a lower part wherein the upper part can be placed on top of the lower part, the upper part comprises a central portion (1), at least two bars (3) are attached to the central portion (1), these bars (3) extend outwards from the central portion (1), there is attached a wheel or a roller (4) to each of the bars (3), a guiding ring for the flexible pipe is attached to the top of at least one of the bars (3), the flexible pipe is fed from the lower part of the device between two of the bars (3) and through the guiding ring, the lower part comprises a central hub (10), a lifting arrangement (7) is attached to the top of the central hub (10) from which the entire device can be lifted, when the device is either lifted by the lifting arrangement (7) or placed on a stand the lower part of the device will rotate freely in either direction relative to the upper part of the device and the central hub (10) when a user either pulls or pushes on the flexible pipe, a second set of bars (9) is attached at one end to the central hub (10),

wherein the bars has a first and a second portion, the first portion extends outwards from the central hub (10) and the second portion are U-shaped, the U-shaped portions of the second set of bars (9) creates a cradle in which the flexible pipes rests, the second set of bars (9), are at a second end, attached to the rim (8) of the lower part of the device.

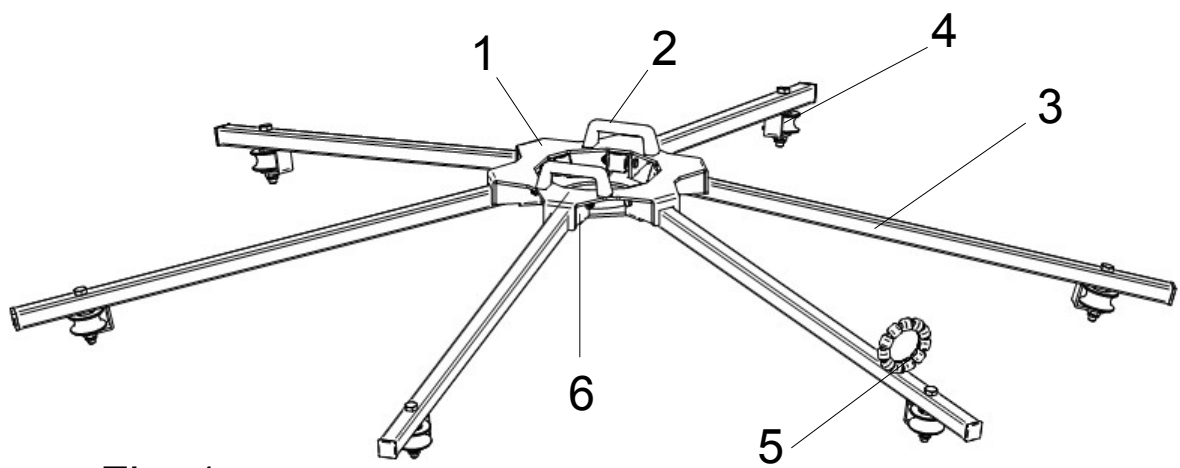


Fig. 1

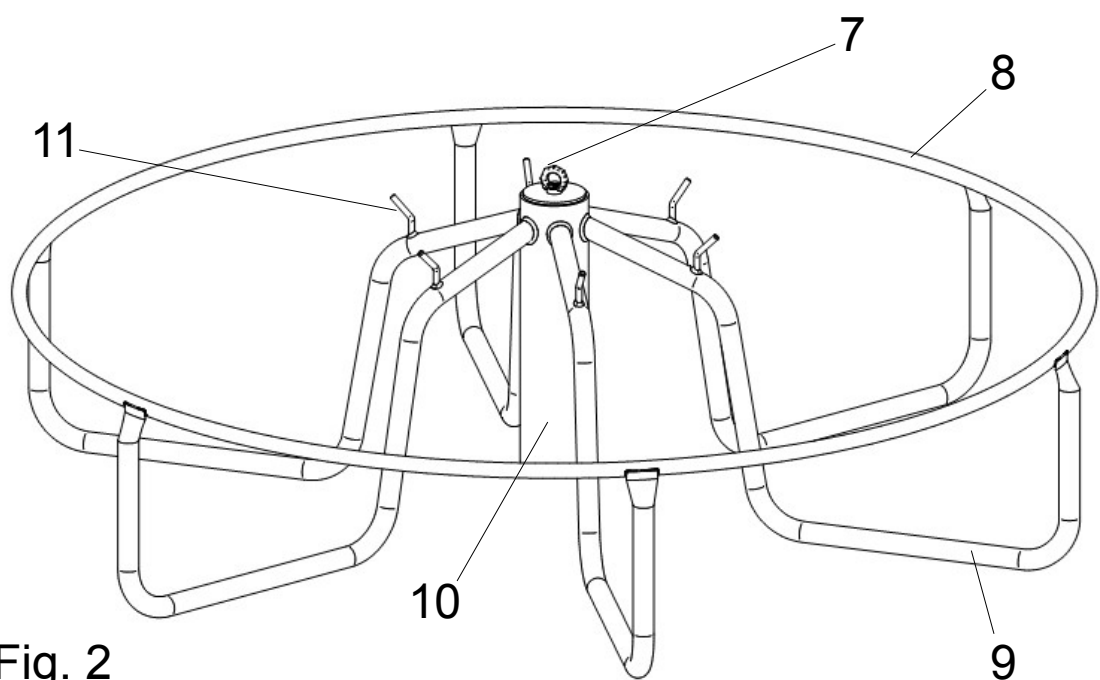


Fig. 2

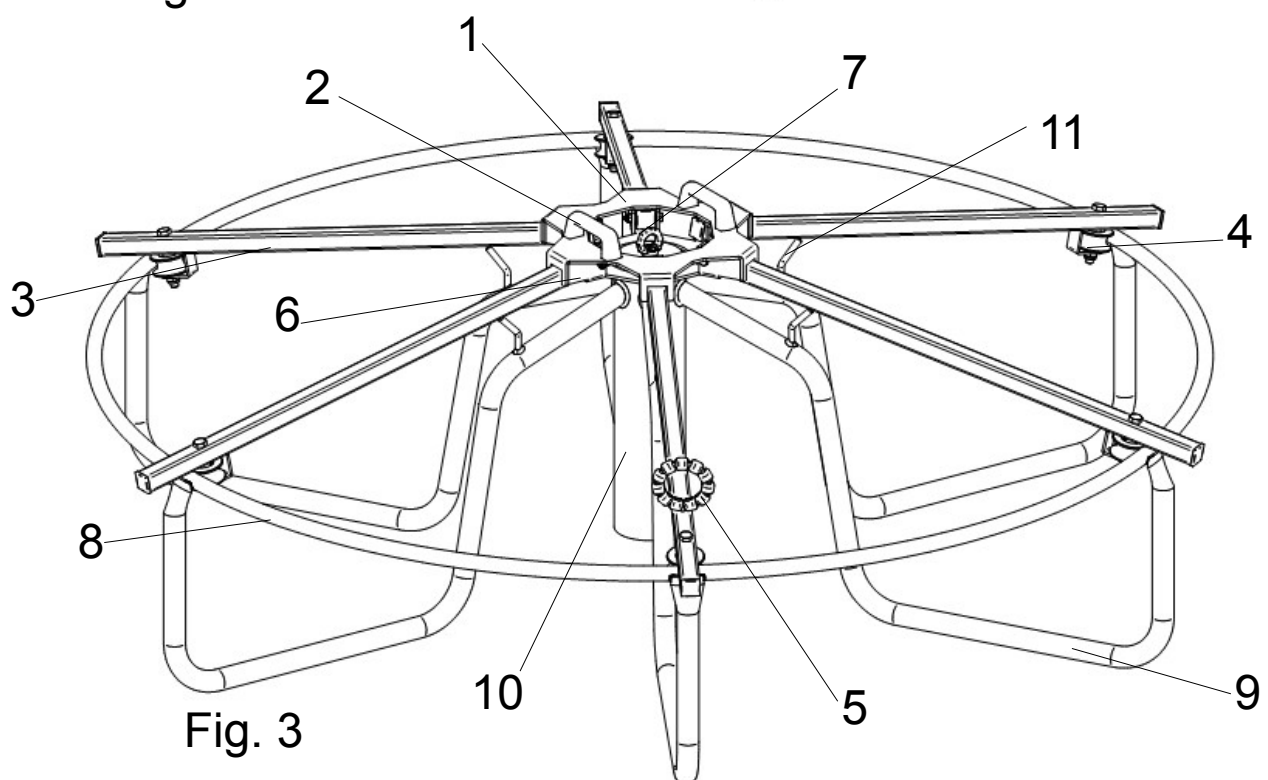


Fig. 3

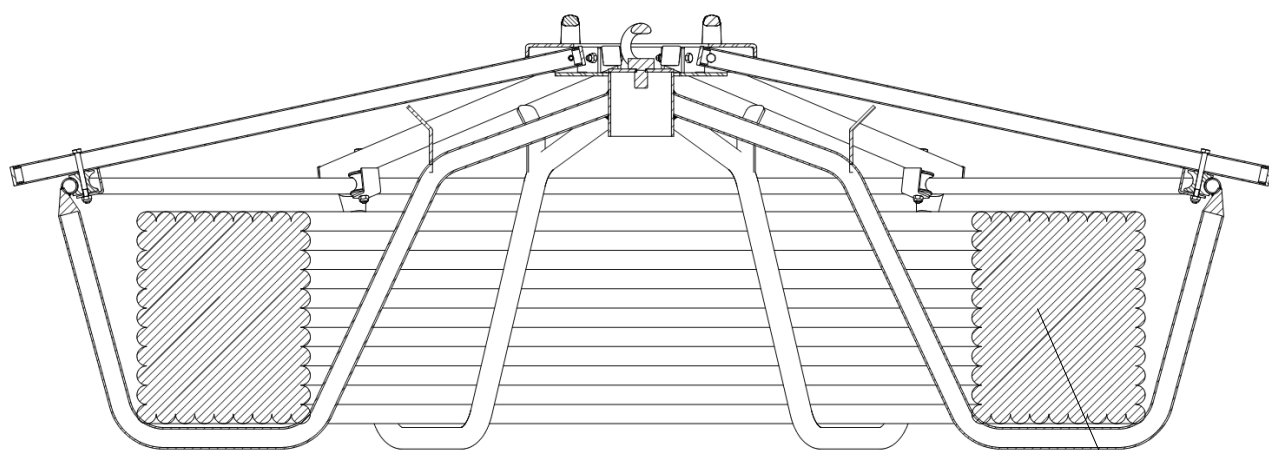


Fig. 4

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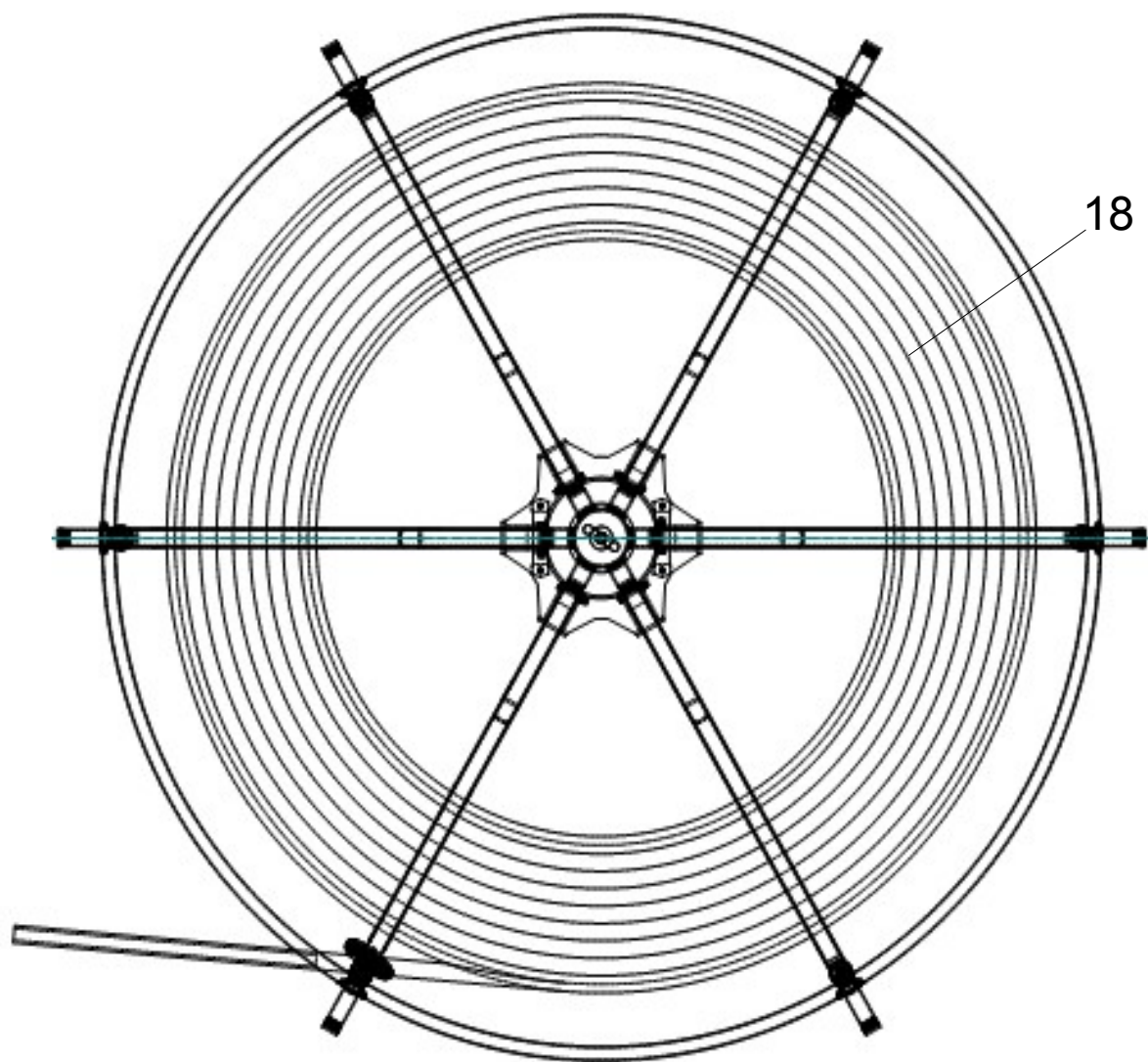


Fig. 5

18

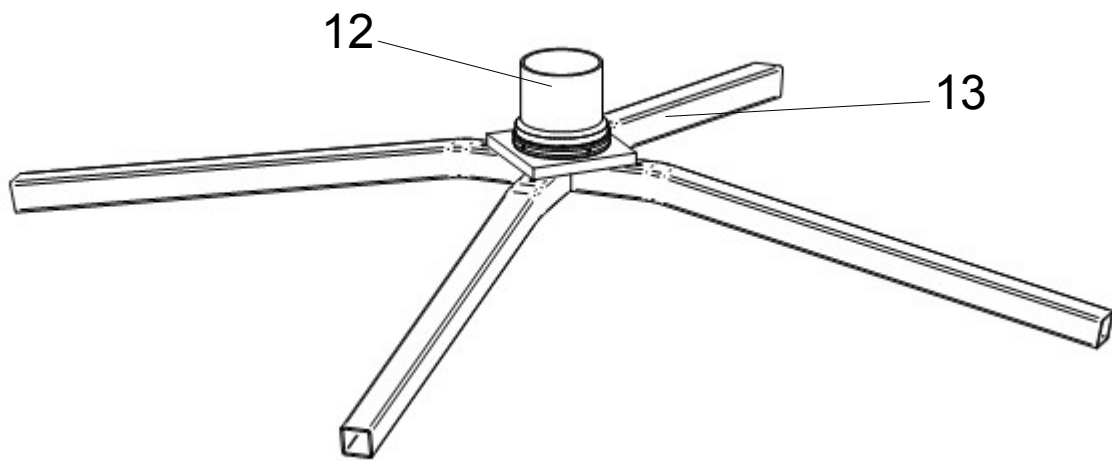


Fig. 6

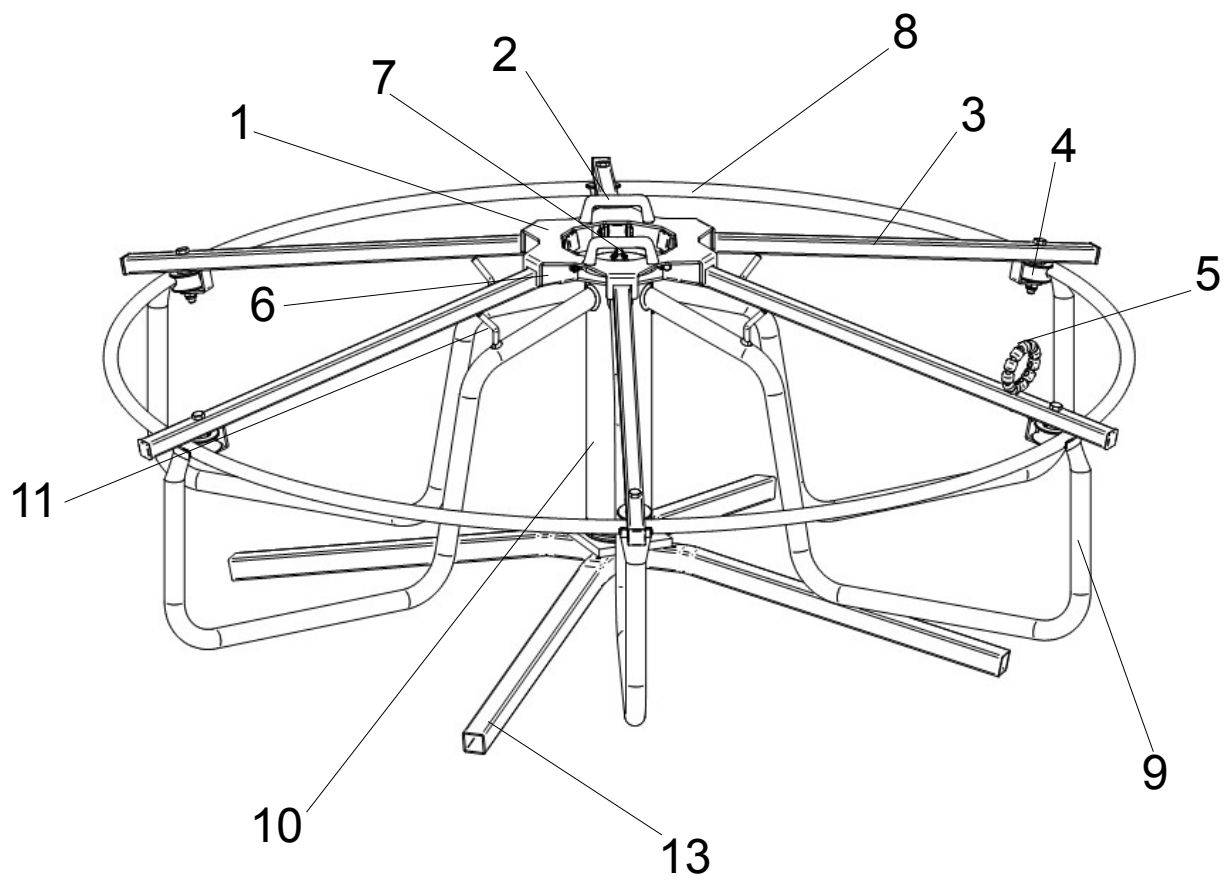


Fig. 7

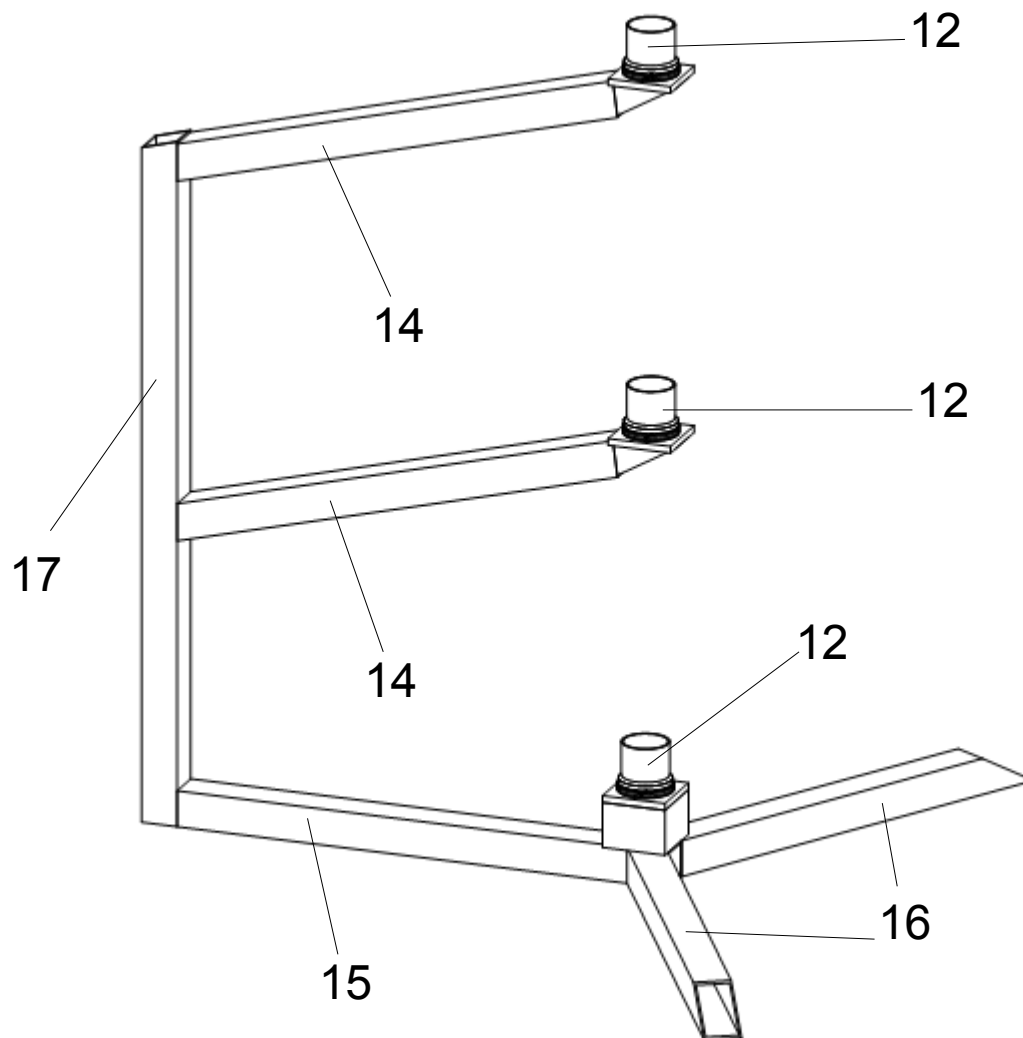


Fig. 8

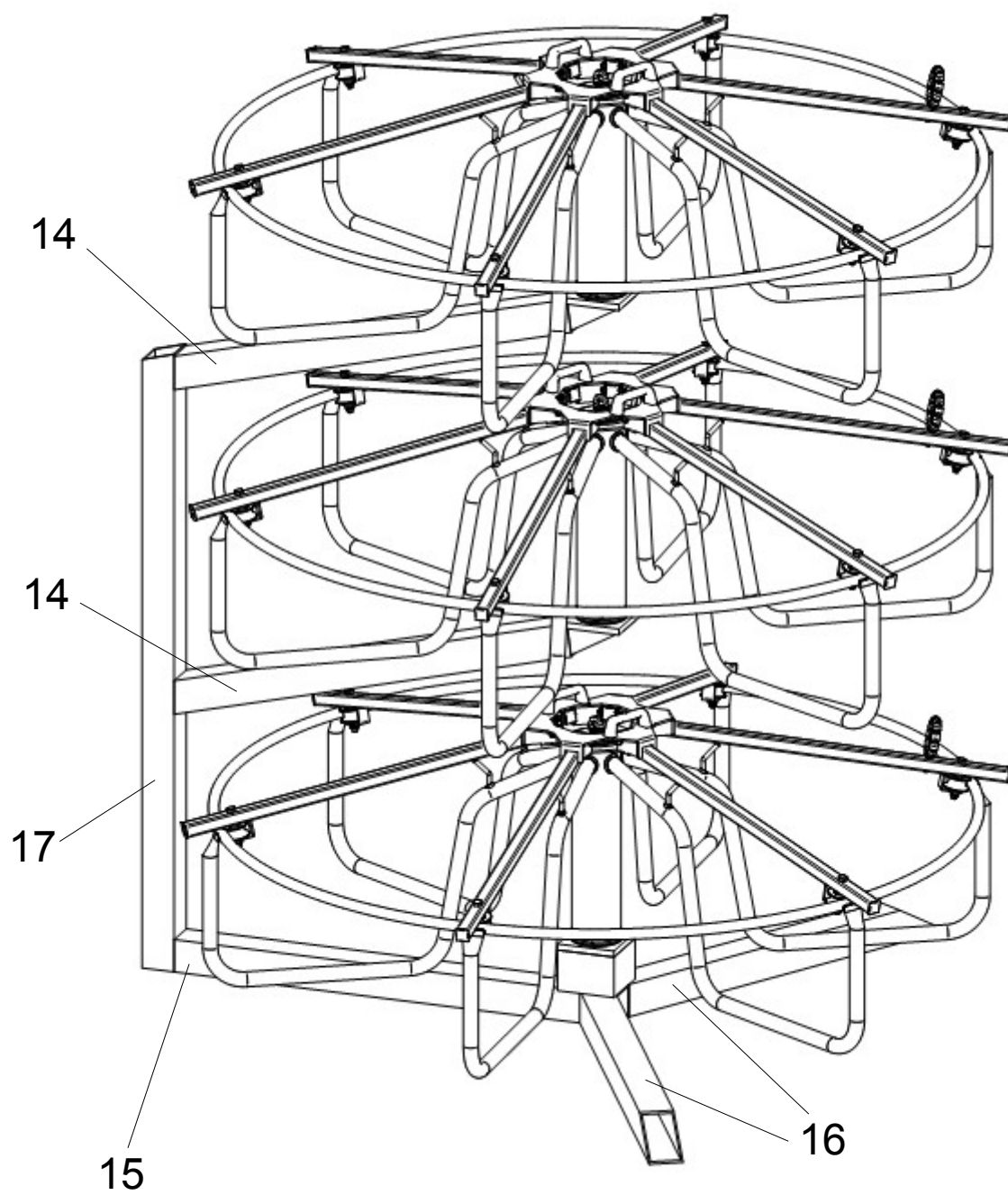


Fig. 9