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(54) **Improved extension part for weed mowers**

(57) The present invention relates to a device constructed as a specific extension part for so-called weed mowers for removing, mainly as rotating sweep instrument, of plants, weeds, dirt and such from paved surfaces, in which the extension part consists of a small brush disc (1) with pick-up spaces (2) made by milling out a solid round disc (1), in which the pick-up spaces (2) are quadrangular for locked receipt of an also well

fitting quadrangular cover (3) with wire bundle (4) which wire bundle (4) normally sticks out straight from underneath the disc (1), in which the locking from the centre is done from a polygonal recess, in which the locking is adjustable and easy to operate with a matching special open-end spanner (14), which is flanged near the end to create a surprisingly simple and very solid attachment of the mentioned cover (3) with wire bundle (4) in the mentioned disc (1).

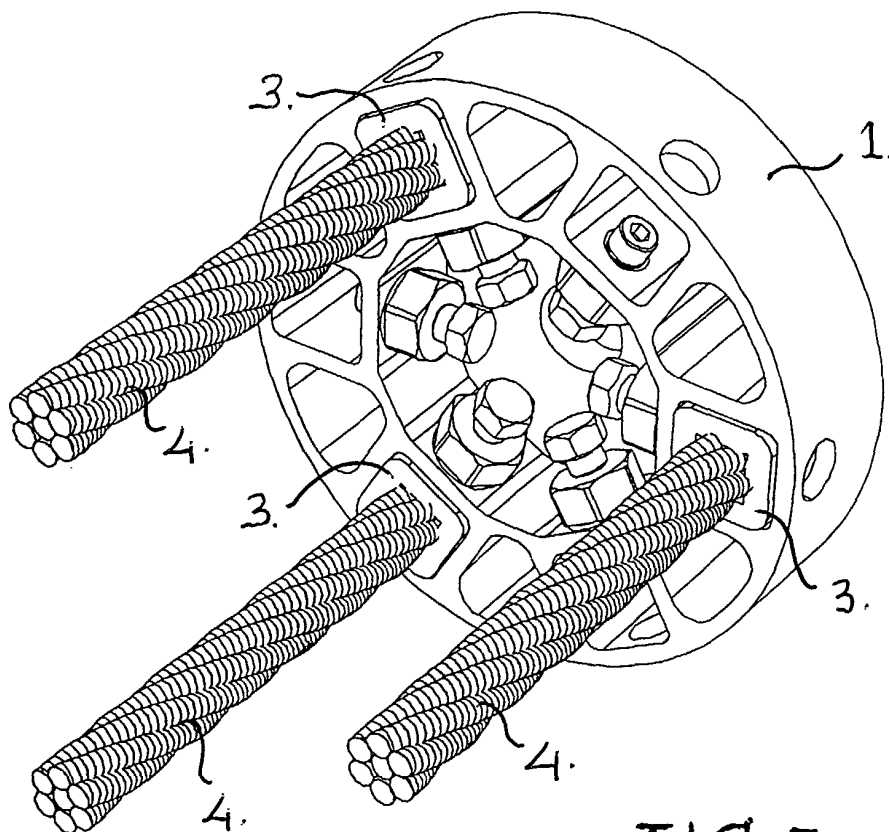


FIG. 5.

Description

[0001] The present invention relates to a device constructed as a specific extension part for weed mowers as a rotating sweep construction, for mainly removing plant remains, weeds, dirt and such from paved surfaces, in which the extension part consists of a disc (small brush disc) with pick-up elements or spaces, in which in each pick-up element a cover can be slid and fixed, which cover on its turn is clamped on a wire bundle for forming the mentioned rotating sweep construction and in which locking the mentioned cover can be done by means of a retaining pin mounted through a wall of the pick-up element or space and falling in a corresponding bore of the mentioned cover with wire bundle.

[0002] A somewhat similar device or brush suitable for fixing underneath a sweep machine is known from the Dutch Patent nr. 1002801, submitted on April 4th, 1996 of Van der WURF, Gerardus Adrianus in Hollandsche Rading in The Netherlands.

[0003] Here it nevertheless concerns a large brush plate suitable for attachment underneath sweep machines, which brush consists of a large disc of a welded construction, that, when used, is in a horizontal surface and is supplied with pick-up bushes divided along the circumference, making an angle with the surface of the disc. The mentioned large brush plate has, complete including the brushes a weight of approximately 45 kg! In each pick-up bush a cover with wire brush as sweeping part can be slid in. Each pick-up bush has a socket against which the cover rests when sliding it in the pick-up bush, so that pushing the cover through the pick-up bush is avoided. On a distance of the socket the pick-up bush has a, to the inside pointed springy stop instrument, which locks the cover in the pick-up bush by means of a matching bore.

[0004] The aforementioned device or brush has a number of disadvantages, being that the whole assembly must be welded together which is very laborious and in which the pick-up bushes must also be welded in an angle underneath the plate or disc, in which the spring loaded pin with its bolt head points outside radially and is strongly liable to large outward centrifugal forces, which can become very high through which the pin can lose its function as a lock. In a safety point of view this is absolutely unacceptable, because a flying out bush with steel wire with large energy as a result of centrifugal forces is perilous for bystanders. Further, the pick-up bushes must be divided orderly around the circumference of the constructed disc and welded very solidly. From the previous information also follows that constructing the whole device or brush assembly is rather costly and hard to make economically sound.

[0005] Besides, the whole, as mentioned, makes a large brush plate and as far as the dimensions and construction goes is not suitable for the so-called weed mowers. Weed mowers are provided with so-called small or compact brush plates. Weed mower is a generic

name for mowers with a long shank.

[0006] The present invention concerns a so-called extension part for this weed mower for removing plants and dirt on hard surfaces. But there are also extension parts available provided with a single rotating thread for mowing grass, or a circular saw for removing bushes and such, or for working as a rotary cultivator and/or arrow the ground.

[0007] Delivery of weed mowers is done by several factory's, such as Stiehl, Honda, Husqvarna ect.

[0008] The aim of the present invention concerns to provide such a device or improved rotating disc-shaped sweep construction as extension part for mounting underneath weed mowers, in which the aforementioned disadvantages are solved and of which the working is better and especially the safety is guaranteed, the operating, mounting and such is much better and can be produced in an economically sound manner.

[0009] For this a device, constructed as an improved rotating disc-shaped sweep construction for mounting underneath sweep machines is further developed on a very inventive way, characterized in that the mentioned disc with pick-up spaces is formed by milling out from a relatively thin cylindrical disc with outer diameter D1 and height H1, also called small brush plate, in which as pick-up spaces almost quadrangular recesses are milled out for the receipt with little clearance of mentioned almost quadrangular cover with wire bundle in an angle α with the horizontal, in which the quadrangular recesses or pick-up spaces have a side of D2 and a depth H2, in which $H2 < H1$, in which the mentioned springy extendible retaining pin with bolt head is applied radially from a central polygonal recess with inscribed circle with diameter D3 and a depth H3 and with that is adjustable with regard to the insert length retaining pin, in which $H3 < H2 < H1$, and in which the mentioned central polygonal recess is provided with a central through bore with diameter D4 for mounting to the weed mower, in which the material of the mentioned relatively thin cylindrical disc has a high tensile strength and elastic modulus and with that is well mechanically processable.

[0010] The advantage is a rotating small brush plate sweep construction for removing dirt and plants from paved surfaces and can easily be mounted underneath a known weed mower and will do good turns in practice. In the magazine H₂O of July 12th 2002 described the environmental effects of weed control on paved surfaces, in which the weed mower with the further developed disc is not yet tested, but this new rotating extension gives high expectations.

[0011] Further the device according to the invention is further developed in such a way, that the mentioned diameter D1 is approximately 130 mm and the height H1 approximately 35 mm, in which the further dimensions are D2 approximately 23 mm, H2 approximately 29 mm, D3 approximately 70 mm, D4 approximately 20 mm variable in connection with the thickness of the weed mowers' shaft and H3 approximately 24 mm.

[0012] The weight of the present small brush plate is, due to using aluminium approximately 950 grams, in which this is supplied with 3 covers with twisted steel wire ends.

[0013] The advantage is that a popular very useable disc is created for rotating sweeping work for weed control underneath weed mowers.

[0014] Furthermore the device according to the invention is further developed in such a way, that the mentioned springy extendible retaining pin for operation with a special open-end spanner is provided with a bolt head, in which the mentioned springy extendible retaining pin is mounted springy and a bolt with larger diameter is screwed in threaded wire in the wall of the mentioned quadrangular recesses and fixed with a roughened safety plate, in which around the shank of the mentioned springy extendible retaining pin a compression spring is applied, in which the insert depth of the mentioned springy extendible retaining pin is adjustable from the central polygonal recess by means of a threaded slot, in which the special open-end spanner is flanged in a small angle α near the end.

[0015] The advantage is that the springy extendible retaining pin by means of mounting in a bolt with larger diameter locks the whole solidly to a wall towards the quadrangular recesses and in which also the insert depth of the locking pin is adjustable.

[0016] Furthermore the device according to the invention is further developed in such a way, that the mentioned wire bundle is twisted steel wire of wire elements with an outer diameter of approximately 14 mm, in which the protruding length of the mentioned steel wire of the wire bundle is approximately 120 mm, and in which the mentioned cover is pushed from a round shape into the quadrangular shape, through which the mentioned steel wire is extremely solidly fixed.

[0017] The advantage is a very solid and wear-resistant wire bundle shaped as a twisted steel wire, which itself does not rotate in the small brush plate and is locked safely with little power in the retaining pin close-fitted in the pick-up elements. By rotation of the brush head, the steel wire turns open so that each separate wire works as a knife on the weeds to be removed and this improves the working.

[0018] The preferred construction of the invention will be described by way of example, and with reference to the accompanying drawing, in which:

Fig. 1 shows a front view of the disc as small brush plate with pick-up elements or spaces and in which the pick-up element is provided with a cover with wire bundle all according to a preferred embodiment of the invention;

Fig. 2 shows a cross-section over the line II-II of figure 1;

Fig. 3 ditto as figure 1 but here is shown with black quadrangulans how the wire bundle can be mounted;

Fig. 4 shows an oblique projection of mounting the covers with wire bundles in the disc as small brush plate by using the special open-end spanner; and

5 Fig. 5 shows a view in oblique projection of the total extension part as disc with rotating wire bundles with quadrangular cover.

[0019] Figure 1 shows a front view of the disc 1 with an outer diameter D1 (approximately 130 mm) and a depth H1 (approximately 35 mm). In the disc 1 six pick-up spaces 2 are milled out with almost quadrangular shape with dimensions D2 (approximately 23 mm) and a depth H2 (approximately 29 mm) for receiving the covers 3 provided with a wire bundle 4. Figure 2 shows this and that in cross-section for further explanation. In the inner milled out polygonal 5, which has an inscribed circle with a diameter D3 (approximately 70 mm) and depth H3 (approximately 24 mm), along the circumference six springy extendible retaining pins 6 with bolt head 7 are applied, which is placed springy (compression spring 8) in a larger bolt 9 which with a rough safety plate 10 in the wall 11. The springy extendible retaining pin 6 locks the cover 3 with wire bundle 4. The wire bundle 4 can preferably also be a twisted steel wire with protruding length of approximately 120 mm. Further, for weight-saving and decreasing the centrifugal force, several (six) recesses 12 are applied by means of milling out. The material of the disc 1 is preferably aluminium alloy, but also a strong plastic such as polypropylene can be eligible. Centrally in the disc 1 a through bore 13 is applied with diameter D4 (approximately 20 mm) for mounting to the weed mower (not indicated). Further the wire bundle 4 is positioned in an angle α of approximately 90 degrees in relation to the surface of the disc 1 (see figure 2).

[0020] Figures 2 and 4 also show that with the special open-end spanner 14, which is flanged near the end in an angle β , the springy extendible retaining pin 6 can be pulled out in direction A by a movement of the special open-end spanner in the direction B.

[0021] Figure 3 shows a front view similar to figure 1 of the disc with black quadrangular with a number of placement possibilities of wire bundles 4 with covers 3.

[0022] Figure 4 again shows in oblique projection the mounting of the cover 3 with wire bundle 4 in the disc 1 as small brush plate with help of the special open-end spanner. Adjustment of the insert length of the retaining pins 6 is done by means of screwing the shank of it, supplied with socket 15 into the head of the retaining pin 6.

[0023] Then figure 5 shows in oblique projection the complete extension part consisting of disc 1 with wire bundles 4 supplied with quadrangular cover 3.

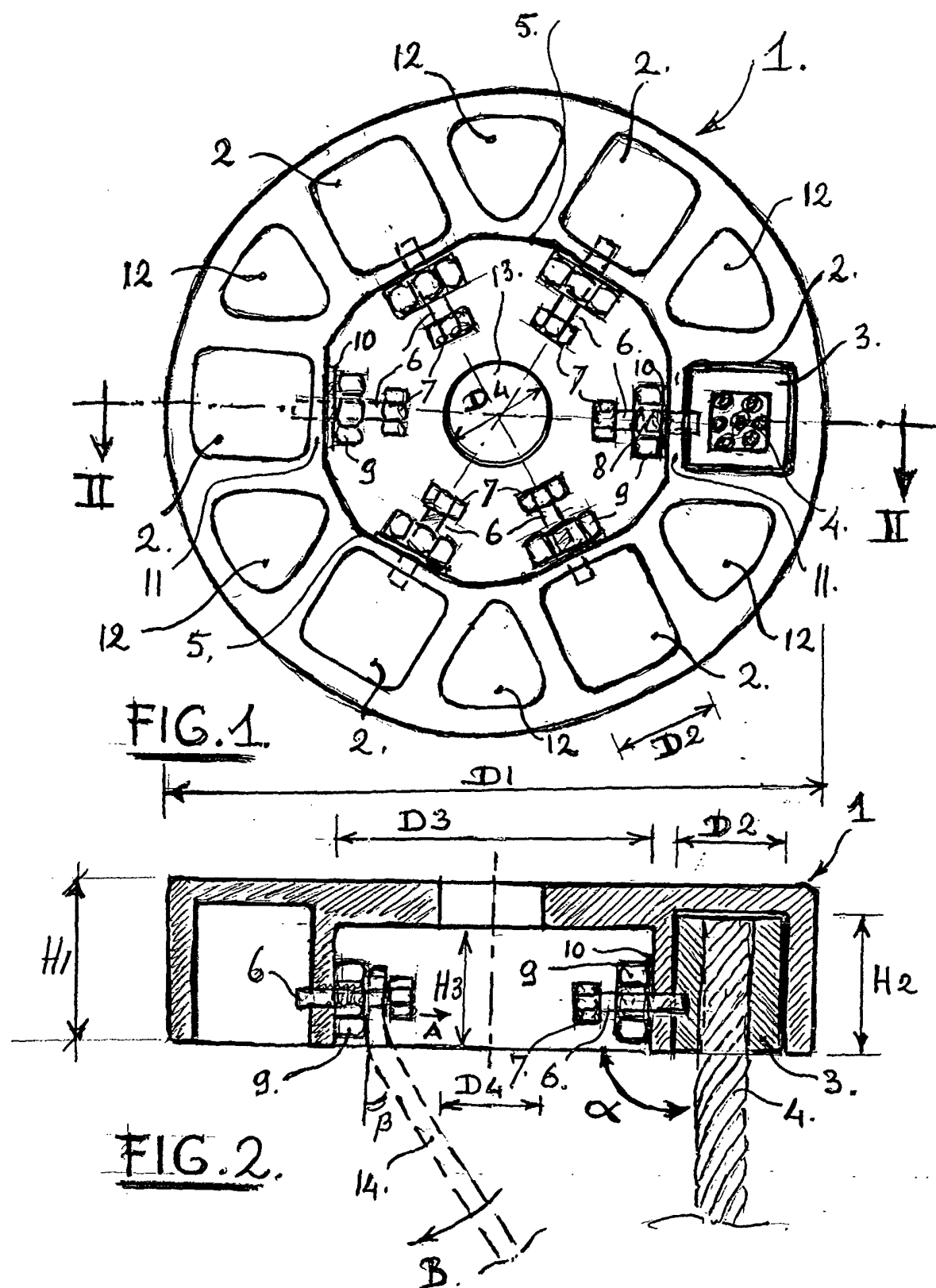
[0024] Finally it has to be emphasized, that the above description constitutes a preferred embodiment of the present invention and that further variations and modifications are still possible without departing the scope of this patent description.

Claims

1. Device constructed as a specific extension part for weed mowers as a rotating sweep construction, for mainly removing plant remains, weeds, dirt and such from paved surfaces, in which the extension part consists of a disc (small brush disc) with pick-up elements or spaces, in which in each pick-up element a cover can be slid and fixed, which cover on its turn is clamped on a wire bundle for forming the mentioned rotating sweep construction and in which locking the mentioned cover can be done by means of a retaining pin mounted through a wall of the pick-up element or space and falling in a corresponding bore of the mentioned cover with wire bundle, **characterized in that**, the mentioned disc (1) with pick-up spaces (2) is formed by milling out from a relatively thin cylindrical disc (1) with outer diameter D1 and height H1, also called small brush plate, in which as pick-up spaces (2) almost quadrangular recesses are milled out for the receipt with little clearance of mentioned almost quadrangular cover (3) with wire bundle (4) in an angle α with the horizontal, in which the quadrangular recesses or pick-up spaces (2) have a side of D2 and a depth H2, in which $H2 < H1$, in which the mentioned springy extendible retaining pin (6) with bolt or nut head (7) is applied radially from a central polygonal recess (5) with inscribed circle with diameter D3 and a depth H3 and with that is adjustable with regard to the insert length retaining pin (6), in which $H3 < H2 < H1$, and in which the mentioned central polygonal recess is provided with a central through bore (13) with diameter D4 for mounting to the weed mower, in which the material of the mentioned relatively thin cylindrical disc (1) has a high tensile strength and elastic modulus and with that is well mechanically processable.
2. Device as claimed in claim 1, **characterized in that**, the mentioned material of the small cylindrical disc (1) is aluminium with a total weight of approximately 950 grams.
3. Device as claimed in claims 1 and 2, **characterized in that**, the mentioned diameter D1 is approximately 130 mm and the height H1 approximately 35 mm, in which the further dimensions are D2 approximately 23 mm, H2 approximately 29 mm, D3 approximately 70 mm, D4 mostly approximately 20 mm dependant on the thickness of the shaft of the weed mower and H3 approximately 24 mm.
4. Device as claimed in claim 1, **characterized in that**, the mentioned quadrangular recess as pick-up space (2) in the extension part of the weed mower receives and locks the almost in cross-section quadrangular pressed cover (3) with wire bundle (4)

of the twisted steel wire by means of retaining pin (6), which falls in a bore with suitable depth in the quadrangular cover (3).

5. Device as claimed in aforementioned claims, **characterized in that**, the mentioned springy extendible retaining pin (6) for operation with a special open-end spanner is provided with a bolt head (7), in which the mentioned springy extendible retaining pin (6) is mounted springy and a bolt (9) with larger diameter is screwed in threaded wire in the wall (11) of the mentioned quadrangular recesses (2) and fixed with a roughened safety plate (10), in which around the shank of the mentioned springy extendible retaining pin (6) a compression spring (8) is applied, in which the insert depth of the mentioned springy extendible retaining pin (6) is adjustable from the central polygonal recess by means of a threaded slot (15), in which the special open-end spanner (14) is flanged in a small angle β near the end.
6. Device as claimed in claim 1, **characterized in that**, the mentioned wire bundle (4) is twisted steel wire of wire elements with an outer diameter of approximately 14 mm, in which the protruding length of the mentioned steel wire of the wire bundle (4) is approximately 120 mm, and in which the mentioned cover (3) is pushed from a round shape into the quadrangular shape, through which the mentioned steel wire (4) is extremely solidly fixed.
7. Device as claimed in claim 1, **characterized in that**, the mentioned angle α is approximately 90 degrees.
8. Device as claimed in claim 1, **characterized in that**, the mentioned angle α is approximately 50 to 70 degrees.
9. Device as claimed in claim 1, **characterized in that**, the mentioned material of the small cylindrical disc (1) and cover (3) with wire bundle (4) as alternative is made of a strong well processable plastic, such as polypropylene and such.



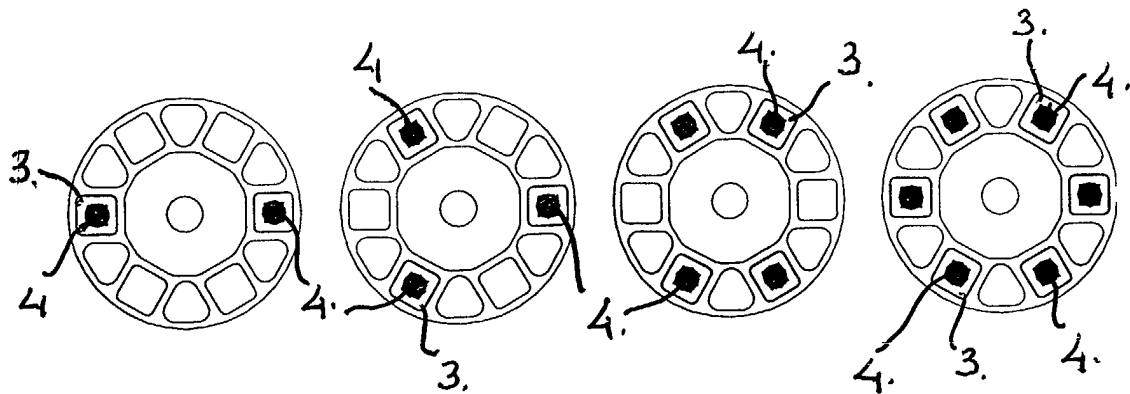


FIG. 3.

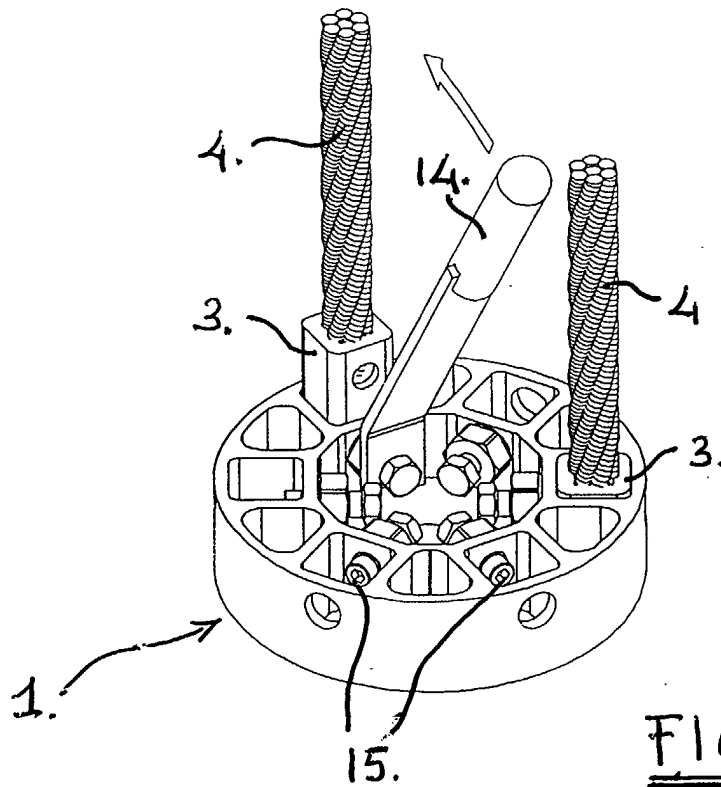


FIG. 4.

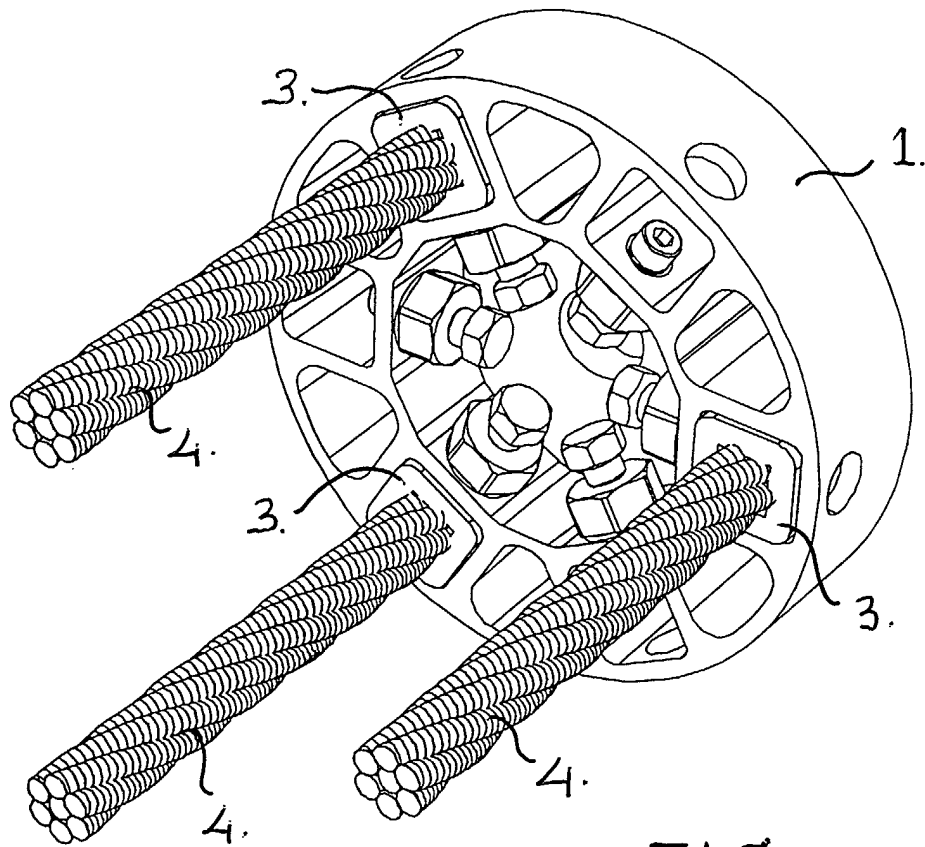


FIG. 5.



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EUROPEAN SEARCH REPORT

Application Number
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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