



Europäisches Patentamt
European Patent Office
Office européen des brevets

⑪ Publication number:

0 106 412
B1

⑫

EUROPEAN PATENT SPECIFICATION

⑯ Date of publication of patent specification: **22.04.87**

⑮ Int. Cl.⁴: **E 02 F 7/06, E 02 F 3/815,**
E 01 C 23/12, B 07 B 1/22

⑰ Application number: **83201459.1**

⑲ Date of filing: **14.10.83**

④ Device for cleaning products.

⑩ Priority: **14.10.82 NL 8203966**

⑦ Proprietor: **Verachtert, Antonius Petrus**
Postbus 3069
NL-5203 BD Den Bosch (NL)

⑪ Date of publication of application:
25.04.84 Bulletin 84/17

⑧ Inventor: **de Gier, Gertrudis Maria Gerardus**
Schepenland 24
NL-5331 RN Kerkdriel (NL)

⑯ Publication of the grant of the patent:
22.04.87 Bulletin 87/17

⑨ Representative: **Noz, Franciscus Xaverius, Jr.**
et al
Boschdijk 155 P.O. Box 645
NL-5600 AP Eindhoven (NL)

⑩ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

⑪ References cited:
EP-A-0 047 041
GB-A-1 512 206
US-A-1 974 717
US-A-2 422 985
US-A-3 765 490

EP 0 106 412 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

Description

The invention relates to a device for cleaning products such as, for example, paving stones or the like comprising a frame having coupling members for attaching the frame to a lift mechanism of a vehicle, a drum journaled in said frame about its at least substantially horizontal longitudinal axis, a power source mounted on said frame for rotating said drum with respect to said frame about said axis of the drum, the wall of said drum having holes and comprising two parts of curved section which are relatively pivotable between a first position in which the drum is open for picking up products and a second position in which the drum is closed.

Such a device is known from EP—A—0047041. In this known device the two drum parts are relatively pivotable about a pivotal shaft journaled in the drum wall, whilst in the closed state the drum has a circular section. Owing to the strongly curved shape of the drum part by means of which the products to be worked have to be picked up from the ground picking up the products requires comparatively much effort, whilst in addition the capacity of picking up is adversely affected. Since furthermore the two drum parts are relatively pivotable about a horizontal pivotal shaft journalled in the drum wall, the centre of gravity of the drum in the open state lies, during operation, at a fairly large distance from the vehicle supporting the device, for example, a wheeled loader or the like, which also has an adverse effect on the capacity of the device.

The invention has for its object to provide a device of the kind set forth by which the above-mentioned disadvantages of the known device can be mitigated.

According to the invention this can be achieved in that a first part of the drum has a prolongation adjoining the curved part and being at least substantially tangential to the curved part whereas the second part is at least substantially concentric with the rotary axis of the drum and is pivotable with respect to the first part about the longitudinal axis between the open position in which the second part extends along the outside of the first part and the closed position in which the second part extends mainly as an extension of said first part.

When the construction embodying the invention is used the products to be picked up during operation can be shifted effectively along the prolongation into the drum so that the energy required for picking up is reduced and the loading capacity is raised. Apart therefrom the device can be constructed in a compact manner with an advantageous location of the centre of gravity both in the open and the closed position of the drum. Further movement of the second part towards the closed position is not hindered by material lying on the first part of the drum.

It is noted that from US—A—3,765,490 there is known a device for cleaning products having a drum with two parts pivotable with respect to

each other about the longitudinal axis of the drum. One part of said drum has been provided with lugs on its outside. By means of said lugs said drumpart can be coupled directly to the arms of a lifting device mounted on a vehicle. In order to permit a rotation of the drum about said longitudinal axis over a relatively small angle there is needed a relatively complicated structure of the arms of the lifting device and the drive means for said arms. Further the pivotable part of the drum which is pivotable with respect to the drumpart having said lugs moves along the innerside of said drumpart.

So opening and closing of the drum when loaded with products will be very difficult if not impossible and the pivotable drumpart will wear excessively.

The drum is preferable adjustable with respect to the coupling members in two positions turned about a vertical axis through at least substantially 180°. By using such a construction, in dependence on the operational conditions, the device can be pushed or pulled by the vehicle carrying the device during operation when picking up the products so that at any time optimum use of the device can be ensured.

The invention will be described more fully hereinafter with reference to an embodiment of a device in accordance with the invention shown schematically in the accompanying Figures.

Fig. 1 schematically shows partly in a side view and partly in a sectional view an embodiment of the device in accordance with the invention, the drum being in the closed position.

Fig. 2 schematically shows partly in a side view and partly in a sectional view the drum in the open position.

Fig. 3 is an enlarged sectional view of a drum support located near one end of the drum.

Fig. 4 is a sectional view taken on the line IV—IV in Fig. 3, some parts being omitted for the sake of clarity.

The frame of the device comprises a few horizontal frame beams 1 and 2 lying one above the other, between which curved plates 3 are arranged. To the plates 3 are secured at right angles plates 4 having holes 5 and recesses 6 for coupling the device with, for example, the lifting device of a vehicle, for example, a wheeled loader or the like.

On both sides of the device struts 7 and 8 are fastened to the above-mentioned frame parts. To the ends of the struts 7 and 8 remote from the first-mentioned frame parts are fastened bearing bushes 9 serving to support a drum 10 arranged between the struts 7 and 8 on both sides of the device and adapted to rotate about a horizontal rotary axis. For supporting the drum the bearing bushes 9 comprise short shafts 12 supported by ball bearings 11 and having blind bores 13.

At the proximal ends the shafts 12 are provided with collars 14 subtending an angle of about 180° and being provided at their ends with projecting noses 15. From Fig. 4 it will be apparent that boundary faces 16 of the protruding collar are in

contact with similar boundary faces of a collar 17 subtending an angle of 180° and being integral with a hub 18. The hub 18 is fastened to a plate 19, which is secured by bolts (not shown) to an annular plate 20, which is fastened to a sidewall 21 of a first drum part 22. A shaft 23 is located in the hub 18 and the blind bore 13 of the shaft 12 and has been screwed with the aid of a screwthreaded part 24 into the bore of the hub 18 also having screw-thread in part of the length. In order to facilitate screwing of the shaft 23 a bolt 25 is welded to the accessible end of the shaft 23.

Fig. 2 shows the drum 10 in the position which the drum will occupy when picking up material, for example, stones lying on the ground. From this Figure it will be apparent that the foremost boundary line 24' of each sidewall 21 of the drum part 22 located for the major part above the rotary axis 23' formed by the registering centre lines of the shafts 12 is upwardly inclined at an angle of about 50°. The adjoining outermost boundary edges of the side plates are at least substantially concentric with the rotary axis 23' up to a plane going horizontally through the rotary axis 23', after which the distance between the rotary axis 23' and the outermost boundary of the drum part 22 gradually decreases, said part finally terminating in an at least substantially tangential part at the level of the ends of the sidewalls 21 terminating in a tip and being interconnected by a broad strip 25' covering the entire width of the drum and being bevelled at the front. The front edge of the strip 25' is provided with projecting tines 26. The curved wall of the drum part 22 is formed by a plurality of horizontal bars 27, which form the upper part of the drum wall in the position of said part shown in Fig. 2 and by a plurality of bars 28 extending parallel to a plane normal to the rotary axis 23 and forming the hindmost and lowermost part of the wall of the drum part 22 in the position shown in Fig. 2.

From Fig. 2 it is furthermore apparent that a beam 29 of at least substantially triangular section is arranged parallel to the strip 25', said beam interconnecting the bars 28 and having its underside located in a plane going through the underside of the plate 25.

It is furthermore apparent from Fig. 2 that the wall part of the drum part 22 adjoining the front edge 24' and being concentric with the rotary axis 23' and formed by the bars 27 is nearer the rotary axis than an adjoining part beginning at the level of the square-section beam 30 extending between the sidewalls 21. At this part of the wall portion of the drum part 22 concentric with the rotary axis, which part is at a shorter distance from the rotary axis 23' and subtends an angle of about 90°, there are arranged near the sides of the drum plates 31 holes 32 of frustoc conical shape for a purpose to be described hereinbelow. Apart from the first drum part 22 the drum comprises a second drum part 33 provided with two side plates 34, whose outer edges being concentric with the rotary axis 23' are interconnected with the aid of beams 35 extending parallel to the rotary axis. Between these beams 35 bars 36 are extending concentrically with the

5 rotary axis 23'. In the position shown in Fig. 2 the second drum part 33 is concentric with and subtends at least substantially the same angle as that part of the first drum part 22 which is slightly nearer the rotary axis 23' than the adjoining curved wall portion of the drum part 22. A beam 35 forming one end of the curved wall portion of the drum part 33 is in contact with the beam 30 of the first drum part 22. The beam 35 forming the other end of the curved wall portion of the drum part 33 is provided with projecting tines 37.

10 It will be apparent from Fig. 3 that the two side plates 34 of the second drum part 33 have fastened to them sleeves 38, which are rotatably arranged on the outer periphery of the hubs 18 with the interposition of bearing shells 39.

15 With each side wall or plate 34 of the second drum part 33 is coupled by means of a pivot pin 40 the end of a piston rod 41 of a setting cylinder 42, which is pivoted to a sidewall 21 of the drum part 22 by means of a pivot pin 43 extending parallel to the pivot pin 40.

20 It will be obvious that with the aid of the setting cylinders 42 the second drum part 33 can be turned with respect to the first drum part 22 from the open position of the drum shown in Fig. 2 to the closed position of the drum shown in Fig. 1, in which the tines 37 pass between the tines 26, the portion of the drum part 33 curved around the rotary axis closes the opening between the ends of the wall portion of the drum part 22 extending around the rotary axis and the plates 34 together with the plates 21 close at least substantially completely the sides of the drum.

25 30 35 40 45 50 55 For the supply and drainage of pressurized fluid, for example, oil to and from the setting cylinders 42 one shaft 12 has a screw threaded bore 44 concentric with the center line of the shaft, into which a first part 45 of a coupling member is screwed. This part 45 is rotatable with respect to the coupling part 46 about an axis coinciding with the rotary axis of the drum, whereby with part 46 communicate an inlet duct and an outlet duct 47 for the supply and drainage of fluid respectively. The bore 44 is in open communication with a channel 44' in the shaft 12 opening out in a tapped bore 44'' in the projecting collar 14, into which a connecting nipple 48 is screwed. The connecting nipple 48 communicates with a duct 49 to be connected with the setting cylinders 42. For the supply and drainage of oil towards and from the setting cylinder disposed near the stub shaft 12 not shown in Fig. 3 a duct can be passed through one of the hollow pipes 27 of the first drum part 22 extending parallel to the rotary axis.

60 65 The shaft 12 located on the other side of the drum than the shaft 12 shown in Fig. 3 is provided with a prolongation protruding from the sleeve 9 on the side remote from the collar 14 concerned. This prolongation has fastened to it a sprocket or pulley 50 (Fig. 1), which is connected by means of a chain or belt 51 with a driving motor, for example, a hydraulic motor 52.

Lock bolts 53 are furthermore coupled with the frame so that these lock bolts are pivotable about

pivotal axes 54 extending parallel to the rotary axis 23' with respect to the frame with the aid of setting cylinders 55, that is to say, between the position indicated in Fig. 1 by solid lines and the position indicated in Fig. 1 by broken lines. In the position indicated by broken lines the ends of the lock bolts 53 are located in the aforesaid holes 32 in plates 31 forming part of the first drum part 22. It will be obvious that in this position the first drum part 22 is locked against a turn about the rotary axis 23'.

The device described above operates as follows.

With the aid of the holes 5 and recesses 6 in the frame the frame can be fastened to the lifting mechanism of a vehicle, for example, the lifting arms of the hydraulic lifting device of a wheeled loader or the like. When the drum is in the opened position shown in Fig. 2, the device can be propelled by the vehicle in the direction of the arrow A, whilst the plate 25' and the beam 10 are slipped along the ground by their undersides. Material lying on the ground can then be advanced along the plate 25' and the adjoining bars 28 into the opened drum. Owing to the initially horizontal and gradually ascending inner wall of the drum part 22 formed by the plate 25' and the bars 28 this introduction of the material is progressively performed. It is also possible to pick up material from a large heap since the inlet opening between the free ends of the drum part 22 has a large height and the interior of the drum is completely free of parts hindering or disturbing the introduction of the material.

When sufficient material is picked up in the drum, the drum can be closed by turning the second drum part 33 from the open position of the drum shown in Fig. 2 into the closed position shown in Fig. 1. Moreover, the drum can be moved upwards by means of the lifting device of the vehicle and after the lock bolts 53 are turned from the position indicated by broken lines into the position indicated by solid lines the drum can be caused to rotate. By this rotation of the drum the stones or a similar material picked up are agitated so that earth or the like adhering to said material is disengaged from the products and will fall out through the openings in the wall of the drum, as a result of which the products are effectively cleaned. Since the inner wall of the drum has a relatively uniform shape undesirable dropping and tumbling movements of the products are avoided, which is particularly important in cleaning stones in order to avoid damage of the stones. Preferably the drum is adapted to rotate in two directions.

After the products are sufficiently cleaned, the drum can be opened by turning the second drum part 33 from position shown in Fig. 1 into the position shown in Fig. 2 and the products can be removed from the drum by setting the first drum part 22 in such a position that the prolongation formed at least essentially by the strip 25' and tangentially adjoining the curved wall portion of the first drum part is inclined downwards so that

the products can easily slide along said part out of the drum.

It will be obvious that when the drum is arranged in the position shown in the Figures in the frame, the drum, when picking up the products and then being displaced in the direction of the arrow A, is pushed on in front of the vehicle carrying the device. The drum can, however, be arranged in the frame in a simple manner in a position in which with respect to the position shown in the Figures the drum is turned through 180° about a vertical axis. For this purpose the shafts 23 can be screwed out of the shafts 18 and the shafts 12. Subsequently with the aid of the lifting device of the vehicle carrying the device the frame can be moved upwards, whilst the drum remains standing on the ground. The vehicle can then be driven to the other side of the device and be turned through 180°, after which the frame is lowered until the faces 16 of the protruding collars come again into contact with the corresponding faces of the protruding collars 17. This deposition of collars 14 on the collars 17 is facilitated by the projecting noses 15. When the collars 14 are bearing again on the collars 17 the shafts 23 can be screwed in.

The collars 14 and 17 not only facilitate the disposition of the frame on the drum in different positions, but also ensure the transfer of the torque required for driving the drum.

In the resultant, new position of the drum in the frame the drum can be drawn on behind the moving vehicle for picking up products. This is advantageous, for example, in picking up paving stones from a road surface, since the vehicle can drive along the still intact part of the road surface. The further operation of the device remains the same. It should be noted that though in the foregoing reference is particularly made to be cleaning paving stones, the device may also be used for cleaning other products such as beets or the like.

The figures used in the claims are only meant to explain more clearly the intention of the invention and are not supposed to be any restriction concerning the interpretation of the invention.

Claims

1. A device for cleaning products such as for example, paving stones or the like comprising a frame (1—3) having coupling members (4—6) for attaching the frame to a lifting mechanism of a vehicle, a drum (10) journaled in said frame (1—3) about its at least substantially horizontal longitudinal axis (23'), a power source (52) mounted on said frame for rotating said drum (10) with respect to said frame about said axis (23') of the drum (10), the wall (22, 23) of said drum (10) having holes and comprising two parts (22, 33) of curved section which are relatively pivotable between a first position in which the drum (10) is open for picking up products and a second position in which the drum is closed characterized in that a first part (22) of the drum has a pro-

longation (25') adjoining the curved part (22) and being at least substantially tangential to the curved part (22), whereas the second part (33) is at least substantially concentric with the longitudinal axis (23') of the drum (10) and is pivotable with respect to the first part about the longitudinal axis (23') between the open position in which the second part (33) extends along the outside of the first part (22) and the closed position in which the second part (33) extends mainly as an extension of said first part.

2. A device as claimed in claim 1 characterized in that the frame comprises two supporting parts (7, 9) located besides the opposite ends of the drum and provided with bearing members (9) for accommodating shafts (12) supporting the drum (10) whereby said bearing members and said shafts (12) are constructed so that with respect to the frame (1—3) the drum can be set in two positions turned about a vertical axis through at least substantially 180°.

3. A device as claimed in claim 1 or 2 characterized in that the distance between the free ends of the first drum part (22) exceeds the radius of curvature of the second drum part (33).

4. A device as claimed in any one of the preceding claims characterized in that the second drum part (33) subtends an angle of about 90°.

5. A device as claimed in any one of the preceding claims characterized in that in the open position of the drum (10) the second drum part (23) extends along the outer side of part (27) of the first drum part (22), said part being off-set in the direction of the rotary axis (23') of the drum (10) with respect to an adjoining part (28, 30) of the first drum part (22).

6. A device as claimed in any one of the preceding claims characterized in that the boundary edges of the two drum parts (22, 33) located near one another in the closed position of the drum are provided with projecting tines (26, 37).

7. A device as claimed in claim 5 characterized in that in the closed position of the drum (10) the tines (26, 37) of the two drum parts (22, 33) pass in between one another.

8. A device as claimed in any one of the preceding claims characterized in that the second drum part (33) is provided with side plates (34) which are adapted to turn about hubs (18) fastened to side plates (21) of the first drum part (22).

9. A device as claimed in any one of the preceding claims characterized in that the two drum parts (22, 33) are relatively pivotable with the aid of setting cylinders (42) arranged between the first drum part (22) and the second drum part (33).

10. A device as claimed in any one of the preceding claims characterized in that the first drum part (22) is provided with hubs (18) holding releasable shafts (23) and ends of the shafts (23) protruding from the hubs (18) are located in bores (13) in shafts (12) journaled in the frame (1—3, 7, 8).

11. A device as claimed in claim 10, characterized in that the hubs (18) fastened to the first drum part (22) are provided with collars (17) sub-

tending an angle of about 180° and co-operating with protruding collars (14) of the shafts (12) journaled in the frame (1—3, 7, 8) also subtending an angle of about 180°.

5 12. A device as claimed in any one of claims 10 or 11 characterized in that a shaft (12) journaled in the frame (1—3, 7, 8) has a blind bore (13) for receiving the shaft (23) passed through the hub (18) of the first drum part (22), whilst the end of the shaft is provided with a coupling piece consisting of two parts (45, 46) relatively rotatable about the centre line of the shaft (12) for the supply of pressurized fluid to a bore (44') in the shaft, which communicates with setting cylinders (42) moving with the drum.

10 13. A device as claimed in any one of the preceding claims characterized in that locking members (53) are provided for fixing the first drum part (22) in a position in which the prolongation (25') is at least substantially horizontal.

15 14. A device as claimed in claim 13 characterized in that the locking members are formed by arms (53) pivotally coupled with the frame (1—3), bent-over ends of which arms can grip in recesses (32) provided for this purpose in the first drum part (22).

20 15. A device as claimed in any one of the preceding claims characterized in that the radius of curvature of the wall of the first drum part (22) initially becomes gradually larger in a direction away from the prolongation (25') and subsequently remains the same to form a first part concentric with the longitudinal axis (23'), which terminates in a part nearer the longitudinal axis (23') and concentric with the longitudinal axis.

Patentansprüche

1. Vorrichtung zur Reinigung von Produkten wie z.B. Pflastersteine oder dergleichen, bestehend aus einem Rahmen (1—3) mit Koppelementen (4—6) zur Befestigung des Rahmens an einen Hebemechanismus eines Fahrzeugs, einer Trommel (10), die in diesem Rahmen (1—3) um ihre mindestens im wesentlichen horizontale Longitudinalachse (23') gelagert ist, einer Energiequelle (52) die auf diesem Rahmen angebracht ist, um die Trommel (10) in Bezug auf diesen Rahmen um diese Achse (23') der Trommel (10) rotieren zu lassen, wobei die Wand (22, 33) der Trommel (10) Löcher hat und zwei Teile (22, 33) mit gekrümmtem Querschnitt aufweist, welche relativ drehbar sind zwischen einer ersten Position, in welcher die Trommel (10) offen ist, um Produkte aufzunehmen, und einer zweiten Position, in welcher die Trommel geschlossen ist, dadurch gekennzeichnet, daß ein erster Teil (22) der Trommel eine Verlängerung (25') hat, welche an den gekrümmten Teil (22) anschließt und mindestens teilweise tangential zum gekrümmten Teil (22) ist, während der zweite Teil (33) mindestens teilweise konzentrisch mit der Longitudinalachse (23') der Trommel (10) und drehbar in Bezug auf den ersten Teil um die Longitudinalachse (23') zwischen der offenen Position, in welcher der zweite Teil (33)

sich entlang der Außenseite des ersten Teils (22) erstreckt, und der geschlossenen Position ist, in welcher der zweite Teil (33) hauptsächlich als Ansatz des ersten Teiles dient.

2. Vorrichtung gemäß Anspruch 1, dadurch gekennzeichnet, daß der Rahmen zwei Trägerteile (7, 9) enthält, die sich neben den gegenüberliegenden Enden der Trommel befinden und Haltevorrichtungen (9) zur Aufnahme von Schafwellen (12) für die Unterstützung der Trommel (10) enthalten, wobei diese Haltevorrichtungen und diese Schafwellen (12) so konstruiert sind, daß in Bezug auf den Rahmen (1—3) die Trommel in zwei um eine Vertikalachse über mindestens praktisch 180° gedrehten Positionen gebracht werden kann.

3. Vorrichtung gemäß Ansprüchen 1 oder 2, dadurch gekennzeichnet, daß die Entfernung zwischen den freien Enden des ersten Trommelteils (22) größer ist als der Radius der Krümmung des zweiten Trommelteils (33).

4. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß der zweite Trommelteil (33) einen Winkel von etwa 90° einschließt.

5. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß in der offenen Position der Trommel (10) der zweite Trommelteil (23) sich entlang der Außenseite des Teils (27) des ersten Trommelteils (22) erstreckt, wobei dieser Teil in Richtung der Rotationsachse (23') der Trommel (10) in Bezug auf einen angrenzenden Teil (28, 30) des ersten Trommelteils (22) versetzt ist.

6. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß die Ränder der beiden Trommelteile (22, 33) die sich in der geschlossenen Position der Trommel nahe einander befinden, mit hervorstehenden Zinken (26, 37) versehen sind.

7. Vorrichtung gemäß Anspruch 6, dadurch gekennzeichnet, daß in der geschlossenen Position der Trommel (10) die Zinken (26, 37) der beiden Trommelteile (22, 33) zwischen einander durchlaufen.

8. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß der zweite Trommelteil (33) mit Seitenplatten (34) versehen ist, welche sich um Naben (18) drehen können, die an den Seitenplatten (21) des ersten Trommelteils (22) befestigt sind.

9. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß die zwei Trommelteile (22, 33) mit Hilfe von Einstellzylinern (42) relativ drehbar sind, welche sich zwischen dem ersten Trommelteil (22) und dem zweiten Trommelteil (33) befinden.

10. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß der erste Trommelteil (22) mit Naben (18) versehen ist, welche auslösbar Achswellen (23) enthalten, wobei die Enden dieser Achswellen (23), die aus den Naben (18) herausragen, sich in Löchern (13) in Achswellen (12) befinden, welche im Rahmen (1—3, 7, 8) gelagert sind.

5 11. Vorrichtung gemäß Anspruch 10, dadurch gekennzeichnet, daß die Naben (18), die an dem ersten Trommelteil (22) befestigt sind, mit Kragen (17) versehen sind, welche einen Winkel von etwa 180° einschließen und mit herausragenden Kragen (14) der Achswellen (12) kooperieren, welche in dem Rahmen (1—3, 7, 8) gelagert sind und ebenfalls einen Winkel von etwa 180° einschließen.

10 12. Vorrichtung gemäß Ansprüchen 10 und 11, dadurch gekennzeichnet, daß die im Rahmen (1—3, 7, 8) gelagerten Achswelle (12) ein blindes Loch (13) zur Aufnahme der Achswelle (23) hat, welche durch die Nabe (18) des ersten Trommelteils (22) läuft, während das Ende der Achswelle mit einem Koppelstück versehen ist, das aus zwei Teilen (45, 46) besteht, die um die Mittellinie der Achswelle (12) relativ drehbar sind, und zwar zwecks Zufuhr von unter Druck stehender Flüssigkeit zu einer Öffnung (44') in der Achswelle, welche in Verbindung steht mit den Einstellzylinern (42), die sich mit der Trommel bewegen.

15 13. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß Blockiervorrichtungen (53) vorgesehen sind, um den ersten Trommelteil (22) in einer Position zu fixieren, in der die Verlängerung (25') mindestens teilweise horizontal ist.

20 14. Vorrichtung gemäß Anspruch 13, dadurch gekennzeichnet, daß die Blockiervorrichtungen aus Armen (53) gebildet werden, die drehbar mit dem Rahmen (1—3) gekoppelt sind, wobei die übergebogenen Enden dieser Arme in Aussparungen (32) eingreifen können, die zu diesem Zweck im ersten Trommelteil (22) angeordnet sind.

25 15. Vorrichtung gemäß einem der vorhergehenden Ansprüchen, dadurch gekennzeichnet, daß der Krümmungsradius der Wand des ersten Trommelteils (22) im Anfang allmählich größer wird in Richtung von der Verlängerung (25') weg, während er anschließend der gleiche bleibt, um einen ersten Teil zu bilden, der mit der Longitudinalachse (23') konzentrisch ist, und schließlich in einem Teil endet, der näher der Longitudinalachse (23') liegt und mit der Longitudinalachse konzentrisch ist.

Revendications

30 1. Dispositif pour nettoyer des produits tels que par exemple des pavés ou analogues comprenant un châssis (1, 3) ayant des éléments d'accouplement (4, 6) pour atteler le châssis à un mécanisme de levage d'un véhicule, un tambour (10), monté à rotation dans le châssis (1—3) autour de son axe longitudinal (23') au moins sensiblement horizontal, une source de puissance (52) montée sur ledit châssis pour entraîner en rotation ledit tambour (10) par rapport audit châssis autour dudit axe (23') du tambour (10), la paroi (22, 33) dudit tambour (10) possédant des orifices et comprenant deux parties (22, 33) de section incurvée, pivotante l'une par rapport à l'autre, entre une première position dans laquelle le tambour 10 est

ouvert pour collecter des produits et une seconde position dans laquelle le tambour est fermé, caractérisé en ce qu'une première partie (22) du tambour possède une prolongation (25') adjointe à la partie incurvée (22) et étant au moins sensiblement tangente à la partie incurvée (22), tandis que la seconde partie (33) est au moins sensiblement concentrique à l'axe longitudinal (23') du tambour (10) et est pivotante par rapport à la première partie autour de l'axe longitudinal (23') entre la position ouverte dans laquelle la seconde partie (33) s'étend le long et à l'extérieur de la première partie (22) et la position fermée dans laquelle la seconde partie (33) s'étend principalement comme une extension de la première partie.

2. Dispositif selon la revendication, caractérisé en ce que le châssis comprend deux éléments de support (7, 8) situés au-delà des extrémités opposées du tambour et équipés de paliers (9) pour recevoir des arbres (12) supportant le tambour (10), de sorte que lesdits paliers et lesdits arbres (12) sont construits pour que le tambour puisse être placé dans deux positions par rapport au bâti (1—3), par rotation autour d'un axe vertical d'environ 180°.

3. Dispositif selon la revendication 1 ou la revendication 2, caractérisé en ce que la distance entre les extrémités libres de la première partie de tambour (22) est supérieure au rayon de courbure de la seconde partie de tambour (33).

4. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que la seconde partie de tambour (33) est inscrite dans un angle au centre d'environ 90°.

5. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que dans la position ouverte du tambour (10), la seconde partie (33) s'étend le long du côté extérieur d'une portion (27) de la première partie de tambour (22), ladite portion étant plus proche de l'axe de rotation (23') du tambour (10) par rapport à une portion adjacente (28, 30) de la première partie de tambour (22).

6. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les bords délimitant les deux parties de tambour (22, 33) disposés l'un à côté de l'autre dans la position fermée du tambour sont pourvus de dents saillantes (26, 37).

7. Dispositif selon la revendication 5, caractérisé en ce que dans la position fermée du tambour (10), les dents (26, 37) des deux parties de tambour (22, 33) s'enchevêtrent.

8. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que la seconde partie de tambour (33) comporte des plaques latérales (34) adaptées pour tourner autour de moyeux (18) fixés à des plaques latérales (21) de la première partie (22) de tambour.

5 9. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que les deux parties de tambour (22, 33) sont pivotantes l'une par rapport à l'autre au moyen de vérins d'entraînement (42) disposés entre la première partie (22) et la seconde partie (33).

10 10. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que la première partie du tambour (22) comporte des moyeux (18) retenant des arbres (23) démontables, et les extrémités des arbres (23) saillant à l'extérieur des moyeux (18) sont disposées dans des orifices (13) ménagés dans des arbres (12) montés à rotation dans le châssis (1—3, 7, 8).

15 11. Dispositif selon la revendication 10, caractérisé en ce que les moyeux (18) fixés à la première partie (22) du tambour comportent des demi-paliers (17) sous-tendant un angle d'environ 180° et coopérant avec des demi-paliers (14) formant extension des arbres (12) montés tournants dans le bâti (1—3, 7, 8) et sous-tendant également un angle d'environ 180°.

20 12. Dispositif selon l'une quelconque des revendications 10 et 11, caractérisé en ce qu'un arbre (12) monté à rotation dans le bâti (1—3, 7, 8) possède un orifice borgne (13) pour recevoir l'arbre (23) monté au travers du moyeu (18) de la première partie du tambour (22), alors que l'extrémité de l'arbre est équipée d'une pièce d'accouplement consistant en deux parties (45, 46) tournante l'une par rapport à l'autre autour de l'axe géométrique de l'arbre (12), pour l'alimentation en fluide sous pression d'un conduit (44') dans l'arbre, qui communique avec les vérins de manœuvre (42) mobiles avec le tambour.

25 13. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce qu'il comporte des éléments de verrouillage (53) pour fixer la première partie de tambour (22) dans une position dans laquelle la prolongation (25') est sensiblement horizontale.

30 14. Dispositif selon la revendication 13, caractérisé en ce que les éléments de verrouillage sont constitués par des bras (53) reliés de manière pivotante au châssis (1—3) l'une des extrémités recourbées de ces bras pouvant pénétrer dans des évidements (32) prévus à cet effet dans la première partie de tambour (22).

35 15. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que le rayon de courbure de la paroi de la première partie de tambour (22) commence par augmenter graduellement lorsque l'on parcourt ladite paroi à partir de la prolongation (25') et ensuite reste sensiblement constant pour former une première portion concentrique à l'axe longitudinal (23') qui se termine par une portion plus proche de l'axe longitudinal (23') et concentrique à ce dernier.

0 106 412

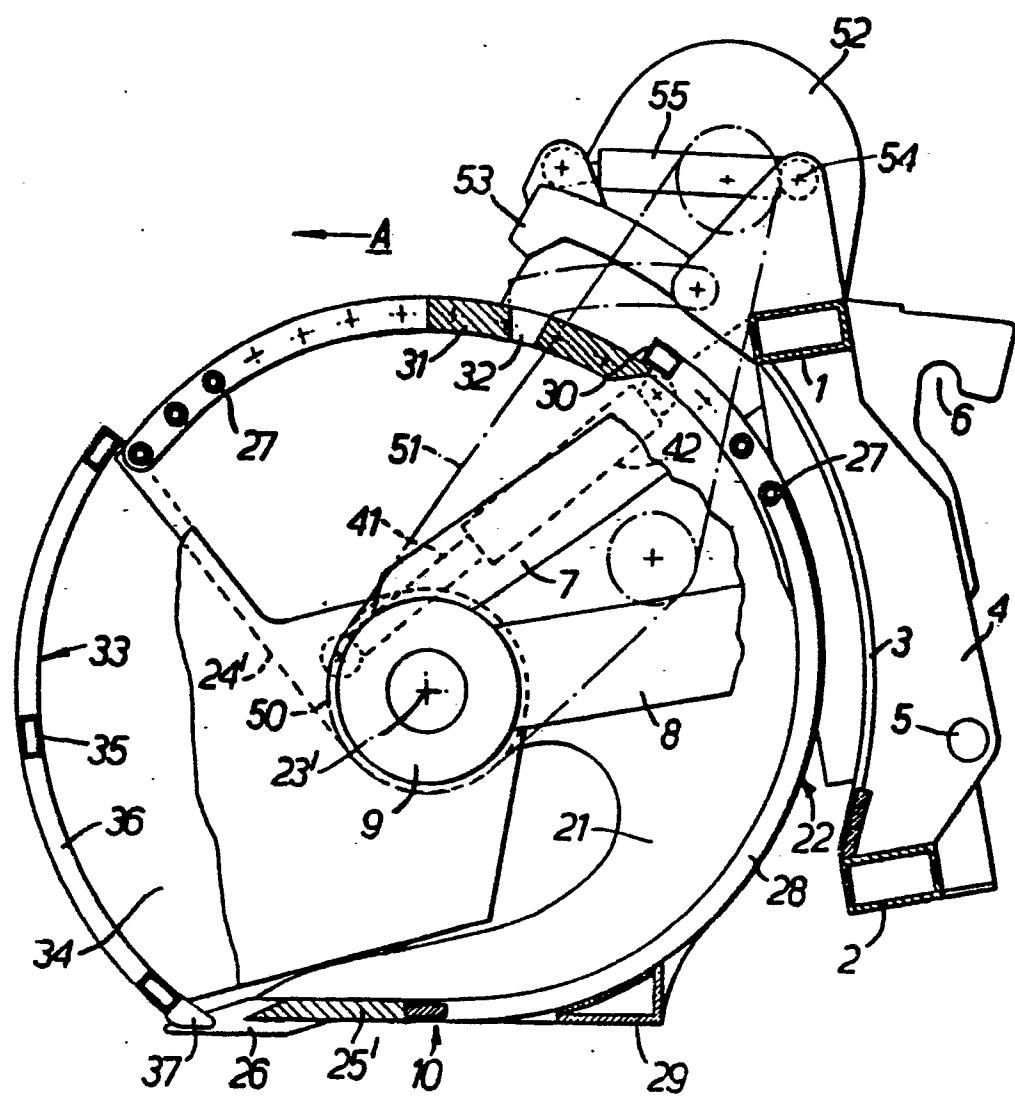


FIG. 1.

0 106 412

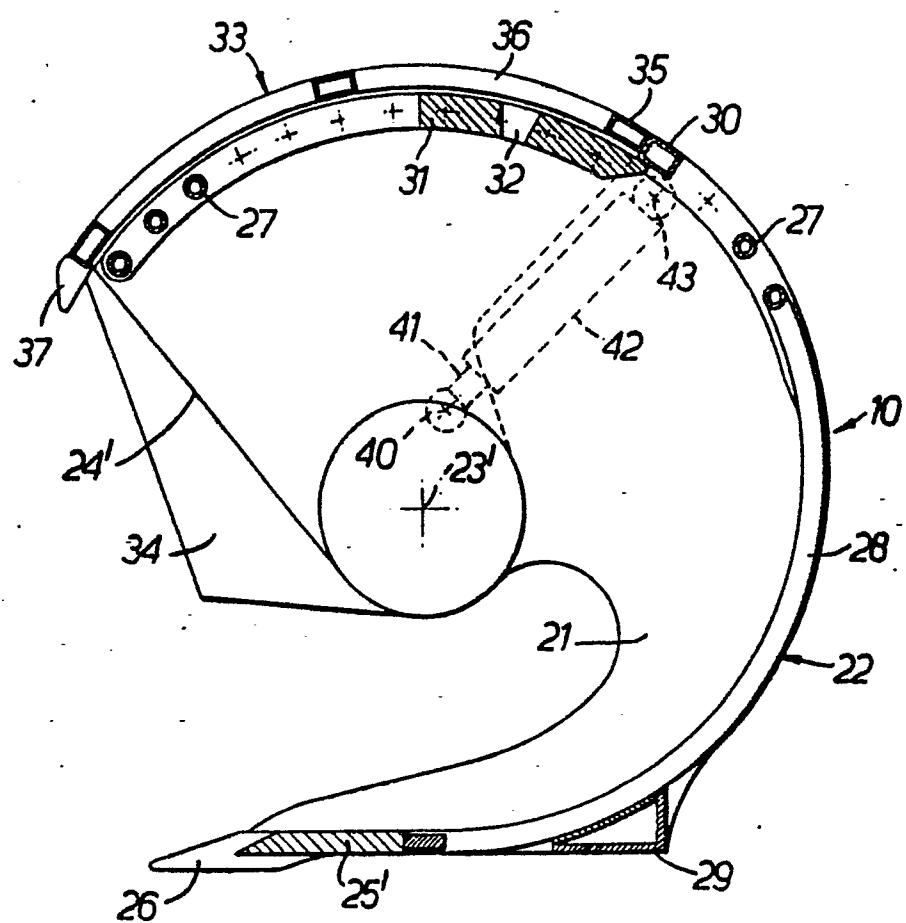


FIG. 2.

0 106 412

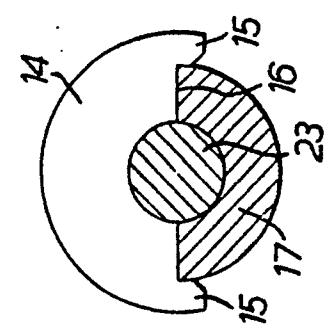


FIG. 4.

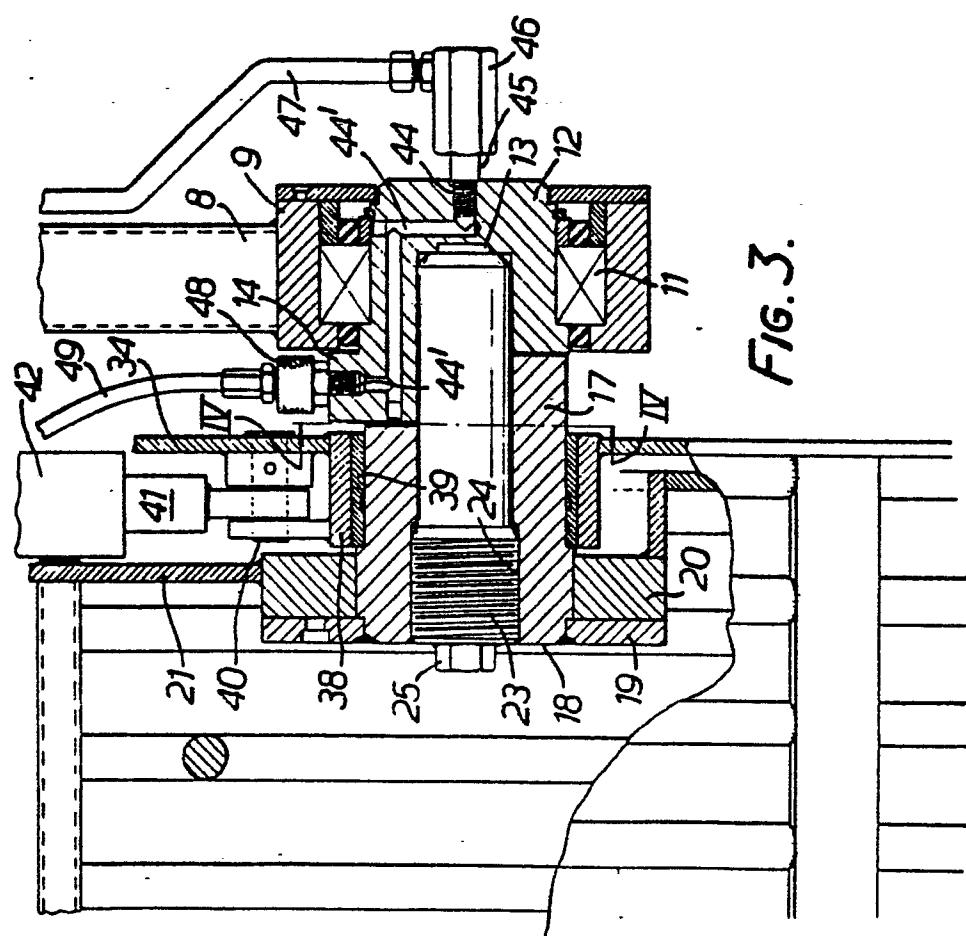


FIG. 3.