

The present invention relates to a cutting appliance for digging trenches in the ground and more particularly to such an appliance of the type comprising at least one substantially vertical support plate, on either side of which two cutting drums are mounted rotatably about an axis substantially perpendicular to the plate.

Such cutting appliances are already known, these generally comprising two plates which consequently support four drums rotating two by two in opposite directions so as to return the cutting waste towards a suction nozzle arranged in the axis of the appliance.

Progressively as such appliances of increasingly high capacity are being produced, it becomes necessary to increase the thickness of the support plate which has to absorb the forces exerted by the ground on the cutting drums.

This thickness of the support plate presents difficulties when the trench is being made. In fact, the cutting tools mounted on the two drums on the same side as the support plate have to be sufficiently far apart from one another to allow this plate to pass during the rotation of the drums. This results in the formation of a step located at the bottom of the trench and of a width generally at least equal to that of the plate.

During the descent of the cutting appliance, the lower edge of the support plate comes up against this step and consequently can prevent the advance of the borehole.

Various solutions to this problem have already been provided. Thus, there has been the idea of mounting the cutting tools located on the same side as the plate movably on the drums in such a way as to bring the tools of the two drums closer to one another when they are in a position free of the support plate. However, this solution has proved too difficult to put into practice, insofar as the axes of articulation of these tools have to support extremely high forces.

Another solution has been provided in the

document FR-A-2,252,011. This solution involves mounting on that edge of each of the drums which is adjacent to the support plate at least one tool projecting laterally relative to this edge, the support plate possessing, 5 opposite the path of these tools, circular grooves which are coaxial with the drum and in which the ends of these tools pass when the drums rotate.

The cutting tools are thus mounted fixedly on the drums, but those tools which project can be set apart at 10 a distance smaller than the thickness of the plate.

This solution has proved satisfactory. However, with the plate thicknesses used at the present time, it is no less true that the step remains of sufficient size to resist the weight of the cutting appliance exerted by 15 means of the low surfaces of the edge of the support plate.

The present invention aims to overcome these disadvantages.

To achieve this, the subject of the invention is 20 a cutting appliance for digging trenches in the ground, of the type comprising at least one substantially vertical support plate, on either side of which two cutting drums are mounted rotatably about an axis substantially perpendicular to the plate, each of the drums carrying, 25 on that of its edges which is adjacent to the support plate, at least one tool projecting laterally relative to this edge, and the support plate possessing, opposite the path of the said tools, circular grooves which are coaxial with the drums and which the ends of these tools 30 enter when the drums rotate, characterised in that the projecting tools of one of the drums are arranged at a distance from the said axis different from the distance of the projecting tools of the other drum from the said axis, the said grooves correspondingly having different 35 radii.

The invention consequently makes it possible to eliminate the step completely. In fact, for that, it is sufficient that the bottoms of the two grooves be substantially in the same plane. Indeed, by offsetting these

planes, it is even possible to ensure that the paths of the projecting tools overlap.

5 The grooves can be machined into the support plate, but the latter is preferably produced from cast steel.

In this case, it can have substantially the form of an S, as seen in section along a plane passing through the axis of the drums.

10 It is also possible, by producing a cast support plate, to equip it without difficulty with fluid feed ducts for the drive motors of the drums, if these are arranged within the drums themselves.

15 A particular embodiment of the invention will now be described by way of non-limiting example with reference to the accompanying diagrammatic drawings in which:

- Figure 1 is a view in vertical axial section of the cutters of the appliance and of their mounting device, and

20 - Figure 2 is a perspective view of this device.

The cutting appliance illustrated in Figure 1 comprises a frame 1, on the lower part of which are mounted cutting drums 2a and 2b equipped on their periphery with cutting tools 3.

25 The drums 2a and 2b are mounted on the frame 1 by means of a supporting device 4 shown in perspective in Figure 2.

30 This supporting device essentially comprises a fastening sole 5, a support plate 6 and a mounting ring 7.

The mid-plane 8 of the support plate 6 is substantially vertical during operation, the axis 9 of the ring being perpendicular to the plane. The cutting drums 2a and 2b are likewise centred on this axis 9. Hydraulic motors (not shown) are mounted inside the ring 7 in order to drive the drums.

35 The drum 2a possesses, towards the plane 8, tools 10a projecting laterally from its edge 11a, whilst the drum 2b possesses, likewise towards the plane 8, tools

10**b** projecting laterally from its edge 11**b**.

The radially outer edge of the tools 10**a** is at a distance r_a from the axis 9, whilst the radially outer edge of the tools 10**b** is at a distance r_b from this same axis which is smaller than r_a .

The tools 10**a** and 10**b** project laterally from the edges of their respective drums for such a distance that they virtually extend as far as the plane 8.

To allow the passage of these tools 10**a** and 10**b** in the upper part of the device 4, the plate 6 has two circ-ular grooves 12**a** and 12**b** centred on the axis 9. The bottoms of the grooves 12**a** and 12**b** are substantially in the plane 8, their radius being respectively equal to r_a and r_b .

Thus, during the rotation of the drums 2**a** and 2**b**, the projecting lateral ends of the tools 10**a** enter the groove 12**a** and the ends of the tools 10**b** enter the groove 12**b**.

In the present case, the support plate 6 is produced from cast steel. The grooves 12**a** and 12**b** are therefore obtained as a result of the casting of the plate, so that the latter has substantially the form of an S in axial section, as seen in Figure 1.

Moreover, in the present case, the plate 6 is equipped with ducts 13 making it possible to feed the hydraulic fluid to the drive motor of the cutting drums.

Figure 1 shows the cutting appliance according to the invention arranged in a trench 14. It can be seen that, in the lower part of the trench, the tools 10**a** leave in place only a half-step 15 which is itself removed by the tools 10**b**.

Various alternatives and modifications can, of course, be made to the foregoing description, without thereby departing either from the scope or from the spirit of the invention.



CLAIMS

1. Cutting appliance for digging trenches in the ground, of the type comprising at least one substantially vertical support plate (6), on either side of which two
5 cutting drums (2a, 2b) are mounted rotatably about an axis (9) substantially perpendicular to the plate, each of the drums carrying, on that of its edges which is adjacent to the support plate, at least one tool (10a, 10b) projecting laterally relative to this edge, and the
10 support plate possessing, opposite the path of the said tools, circular grooves (12a, 12b) which are coaxial relative to the drums and which the ends of these tools enter when the drums rotate, characterised in that the projecting tools (10a) of one of the drums (2a) are
15 arranged at a distance (r_a) from the said axis (9) different from the distance (r_b) of the projecting tools (10b) of the other drum (2b) from the said axis (9), the said grooves (12a, 12b) correspondingly having different radii about the said axis 9.
- 20 2. Cutting appliance according to Claim 1, characterised in that the bottoms of the two grooves (12a, 12b) are substantially in the same plane (8).
3. Cutting appliance according to either one of Claims 1 and 2, characterised in that the said support
25 plate (6) is produced from cast steel.
4. Cutting appliance according to any one of Claims 1 to 3, characterised in that the said support plate (6) has substantially the form of an S, as seen in section along a plane passing through the axis (9) of the drums.
- 30 5. Cutting appliance according to any one of Claims 1 to 4, characterised in that the said support plate (6) possesses fluid feed ducts (13).