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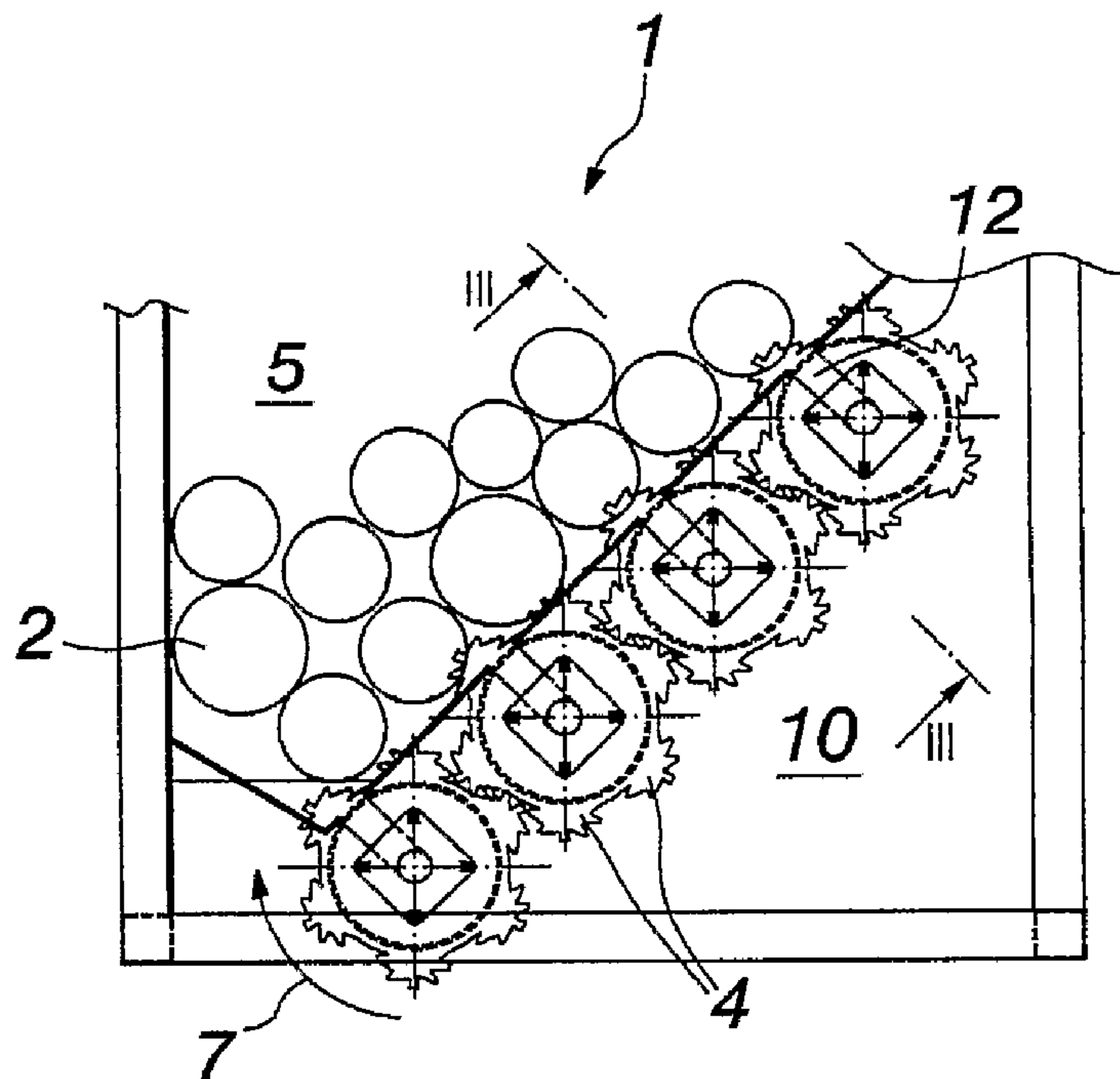
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(54) Titre : SYSTÈME D'ARBRE D'ECORCAGE DESTINÉ À UN MÉCANISME D'ECORCAGE

(54) Title: DEBARKING SHAFT ARRANGEMENT FOR A DEBARKING MECHANISM



(57) Abrégé/Abstract:

The invention relates to a debarking shaft arrangement for a debarking mechanism (1), said debarking mechanism (1) being intended for the decortication or pretreatment of trees (2) for separately performed final barking and for the expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism, said debarking mechanism comprising a number of rotatable debarking shafts (3) extending parallel to the advancing direction of the trees (2) to be fed therethrough and provided with a number of teeth (4) extending beyond the circumferential surface of the shaft (3) and adapted to strip bark off the presently processed trees (2) transversely to the lengthwise direction of the trees and at the same time to convey the trees transversely relative to said shafts (3), and said shafts (3), together with the teeth (4) thereof, being adapted to constitute at least a part of a support surface, upon which the presently processed trees (2) travel through the debarking mechanism (1). The teeth (4) are designed to be effective in both rotating directions of said rotatable debarking shafts (3), and the debarking shafts (3) are designed to be pivotable.

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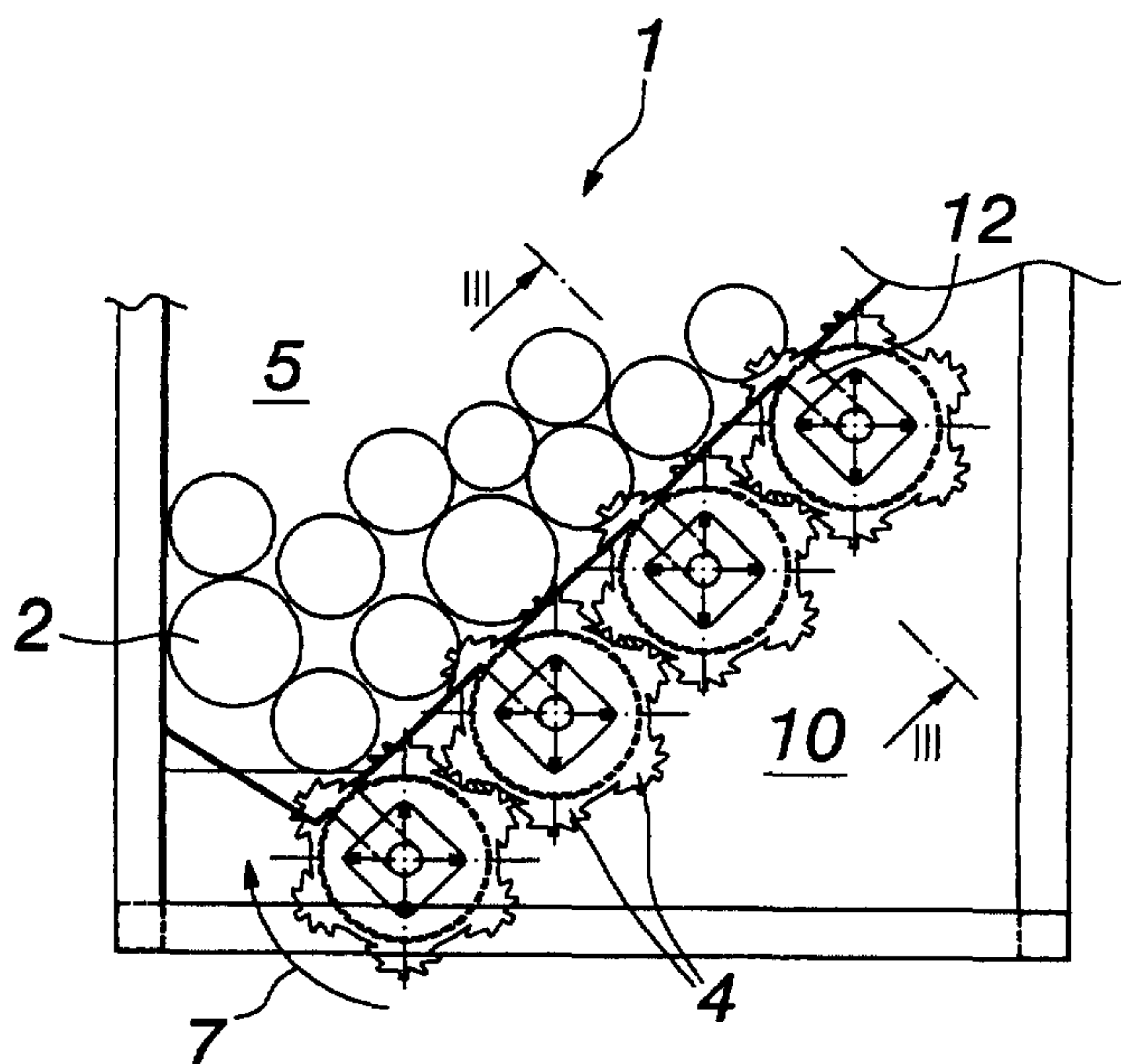
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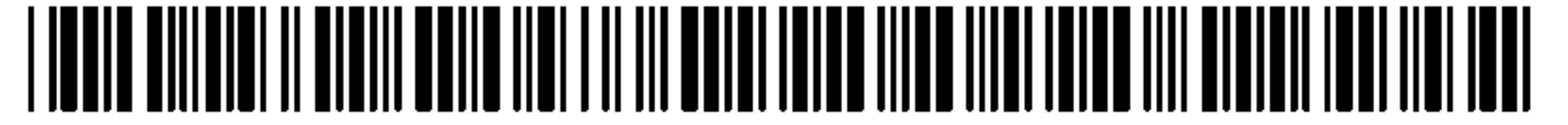
(54) Title: DEBARKING SHAFT ARRANGEMENT FOR A DEBARKING MECHANISM



(57) Abstract: The invention relates to a debarking shaft arrangement for a debarking mechanism (1), said debarking mechanism (1) being intended for the decortication or pretreatment of trees (2) for separately performed final barking and for the expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism, said debarking mechanism comprising a number of rotatable debarking shafts (3) extending parallel to the advancing direction of the trees (2) to be fed therethrough and provided with a number of teeth (4) extending beyond the circumferential surface of the shaft (3) and adapted to strip bark off the presently processed trees (2) transversely to the lengthwise direction of the trees and at the same to convey the trees transversely relative to said shafts (3), and said shafts (3), together with the teeth (4) thereof, being adapted to constitute at least a part of a support surface, upon which the presently processed trees (2) travel through the debarking mechanism (1). The teeth (4) are designed to be effective in both rotating directions of said rotatable debarking shafts (3), and the debarking shafts (3) are designed to be pivotable.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Debarking shaft arrangement for a debarking mechanism

The invention relates to a debarking shaft arrangement for a debarking mechanism, said debarking mechanism being intended for the decortication or pretreatment of trees for separately performed final barking and for the
5 expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism, said debarking mechanism comprising a number of rotatable debarking shafts extending parallel to the advancing direction of trees to be fed therethrough and provided with a number of
10 teeth extending beyond the circumferential surface of the shaft and adapted to strip bark off the presently processed trees transversely to the lengthwise direction of the trees and at the same to convey the trees transversely relative to said shafts, and said shafts, together with the teeth thereof, being adapted to constitute at least a part of a support surface, upon which the
15 presently processed trees travel through the debarking mechanism.

The above type of debarking mechanism is prior known for example from US patents 4,685,498 and 5,394,912.

20 A problem with the above type of prior known debarking mechanisms is the inconvenience and high cost of repairing worn or damaged teeth. The teeth must be repaired one at a time while the debarking shaft remains stationary in the debarking mechanism.

25 In order to eliminate these drawbacks, the arrangement according to the invention in a debarking shaft system for a debarking mechanism is such that the teeth are designed to be effective in both rotating directions of said rotatable debarking shafts, and that the debarking shafts are designed to be pivotable.

This system enables a speedy deployment of new teeth just by pivoting and securing a shaft at 180° relative to the original position, whereby it is parallel to the original position but has an opposite rotating direction with respect to the original position.

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The teeth working in the opposite rotating directions of a debarking shaft can be different from or similar to each other. When using dissimilar teeth in the opposite rotating directions of a shaft, a different debarking capacity will be obtained in various rotating directions, e.g. for wintertime barking and summertime barking. It is also possible to use sharp teeth first for the decortication of hard-to-bark or frozen trees, and to use worn teeth for the treatment of easy-to-bark trees.

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In one preferred application of the invention, the arrangement is such that the debarking shaft is designed and dimensioned in such a way that a dislodged shaft, after being pivoted through 180°, is mountable in the same position or in a corresponding position. This arrangement is relevant primarily when the debarking mechanism is provided with two types of shafts which are symmetrical in terms of the mounting and axial pitch thereof. Thus, every other position is always provided with an identical shaft. The above expression "a corresponding position" should be understood on this basis.

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In particularly preferred embodiments of the invention, the arrangement is such that the debarking shaft is designed and dimensioned in such a way that a dislodged shaft, after being pivoted through 180°, is mountable in the position of an adjacent shaft or in a corresponding position. The expression "a corresponding position" refers to those alternating positions for a debarking shaft in which the shafts lie co-directionally. This arrangement is applicable when all debarking shafts in a debarking mechanism are identical to each other. This arrangement offers the advantage that the debarking

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mechanism only requires a single type of spare shaft that is hence fit for all positions. In principle, such a shaft could be secured in the same position in each of its pivoted positions, but this would require e.g. different attachment points for different shaft pivoting directions.

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In yet another preferred embodiment of the invention, the arrangement is such that the attachment of a debarking shaft to a debarking mechanism is implemented in such a way that, in the process of dislodging, the shaft is liftable from its position and, respectively, in the process of installation, 10 settable into its position through a wood handling facility.

According to a first aspect of the invention, there is provided a debarking shaft arrangement for a debarking mechanism (1), said debarking mechanism (1) being intended for the decortication or pretreatment of 15 trees (2) for separately performed final barking and for the expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism, said debarking mechanism comprising a number of rotatable debarking shafts (3) extending parallel to an advancing direction of the trees (2) to be fed therethrough and provided with a 20 number of teeth (4) extending beyond a circumferential surface of the shaft (3) and adapted to strip bark off the presently processed trees (2) transversely to a lengthwise direction of the trees and at the same time to convey the trees transversely relative to said shafts (3), and said shafts (3), together with the teeth (4) thereof, being adapted to constitute at least 25 a part of a support surface, upon which the presently processed trees (2) travel through the debarking mechanism (1), characterized in that the teeth (4) are designed to be effective in both rotating directions of said rotatable debarking shafts (3), and that the debarking shafts (3) are designed and dimensioned in such a way that a dislodged shaft (3), after 30 being pivoted through 180 degrees, is mountable in a position from which it was removed or in place of another debarking shaft (3).

3A

An exemplary embodiment of the present invention will now be described in more detail with reference to the accompanying drawings, in which:

5 FIG. 1 shows debarking shafts for a debarking mechanism of the invention, in a schematic side view.

FIG. 2 shows a section along line II--II in fig. 1.

10 FIG. 3 shows a section along line III--III in fig. 2.

A debarking mechanism 1 depicted in the drawings is intended for the decortication or pretreatment of trees 2 for separately performed final barking and for the expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism.

15 The debarking mechanism 1 is provided with a number of rotatable debarking shafts 3 extending parallel to the advancing direction of the trees 2 to be fed therethrough. In the illustrated example, the debarking shafts 3 have each end thereof provided with sprockets 6, whereby, at
20 least at one end of the debarking mechanism 1, the sprockets 6 are by way of a sprocket

chain (not shown) to each other and to the gear of an electric motor, not shown.

The debarking shafts 3 are provided with a number of teeth 4 extending beyond the circumferential surface of the shaft 3 and adapted to strip bark
5 off the presently processed trees 2 transversely to the longitudinal direction of the trees and at same time to convey the trees transversely relative to the debarking shafts 3.

The debarking shafts 3, together with the teeth 4 thereof, constitute a part
10 of a support surface for carrying the trees 2 through the debarking mechanism 1. The illustrated example includes four debarking shafts 3 which are assembled relative to each other to define an inclined plane. Other than that, the support surfaces comprise solid surfaces which are designed for providing, together with the support surface constituted by the debarking
15 shafts, an open-ended chute covering the debarking mechanism 1 from end to end. The chute can be open-topped or covered.

The teeth 4 carried by the debarking shafts 3 are designed to be effective in both rotating directions of the debarking shafts 3. However, in the debarking
20 mechanism 1, the debarking shafts 3 are all rotating always in the same direction as indicated by an arrow 7 (fig. 2). The teeth 4 effective in various directions can nevertheless be exploited when the debarking shafts 3 are designed to be pivotable.

25 In the solution of fig. 1, all four debarking shafts 3 are designed to be identical to each other. However, the teeth set at regular spaces along the circumference of the debarking shaft 3 are positioned asymmetrically in the lengthwise direction of the shaft 3, an intermeshing for the teeth 4 of the adjacent shafts 3 being accomplished by installing the adjacent shafts 3 in
30 opposite directions, i.e. reversed by 180°.

The teeth 4 effective in opposite rotating directions of the debarking shaft 3 can be different from or similar to each other. This arrangement enables a speedy deployment of new teeth just by pivoting and securing a shaft at 180° relative to the original position, whereby it is parallel to the original position but has an opposite rotating direction with respect to the original position. For example, the topmost shaft in fig. 1 in a reversed condition can be substituted either for the shaft second from top or for the lowermost shaft.

10 The debarking shafts 3 have each end thereof provided with smaller-diameter shaft stubs 8, on which are mounted bearings, along with bearing cups 9 therefor, as well as the sprockets 6. The bearing cups 9 are adapted to be secured with screws 11 to end panels 10 present at the ends of the debarking mechanism 1 in line with the debarking shafts 3.

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The debarking shaft 3 has its attachment to the debarking mechanism 1 implemented in such a way that, in the process of dislodging, the shaft 3 is liftable from its position and, respectively, in the process of installation, settable into its position through a wood treating space 5 present in the debarking mechanism 1. In the illustrated example, this is implemented in such a way that the end panels 10 have a top edge thereof provided with open-topped grooves 12 for the shaft stubs 8 of the debarking shafts 3.

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Claims

1. A debarking shaft arrangement for a debarking mechanism (1), said debarking mechanism (1) being intended for the decortication or
5 pretreatment of trees (2) for separately performed final barking and for the expulsion of at least some of the removed barks from a wood flow passing through the debarking mechanism, said debarking mechanism comprising a number of rotatable debarking shafts (3) extending parallel to an advancing direction of the trees (2) to be fed therethrough and provided
10 with a number of teeth (4) extending beyond a circumferential surface of the shaft (3) and adapted to strip bark off the presently processed trees (2) transversely to a lengthwise direction of the trees and at the same time to convey the trees transversely relative to said shafts (3), and said shafts (3), together with the teeth (4) thereof, being adapted to constitute at least
15 a part of a support surface, upon which the presently processed trees (2) travel through the debarking mechanism (1), characterized in that the teeth (4) are designed to be effective in both rotating directions of said rotatable debarking shafts (3), and that the debarking shafts (3) are designed and dimensioned in such a way that a dislodged shaft (3), after
20 being pivoted through 180 degrees, is mountable in a position from which it was removed or in place of another debarking shaft (3).
2. An arrangement as set forth in claim 1, characterized in that the teeth (4) effective in opposite rotating directions of the debarking shaft (3) are
25 different from each other.
3. An arrangement as set forth in claim 1, characterized in that the teeth (4) effective in opposite rotating directions of the debarking shaft (3) are identical to each other.
30
4. An arrangement as set forth in any one of claims 1 to 3,

characterized in that the debarking shaft (3) is attached to the debarking mechanism (1) in such a way that, in the process of dislodging, the shaft (3) is liftable from a position and, respectively, in the process of installation, settable into a position through a wood treating space (5) present in the debarking mechanism (1).

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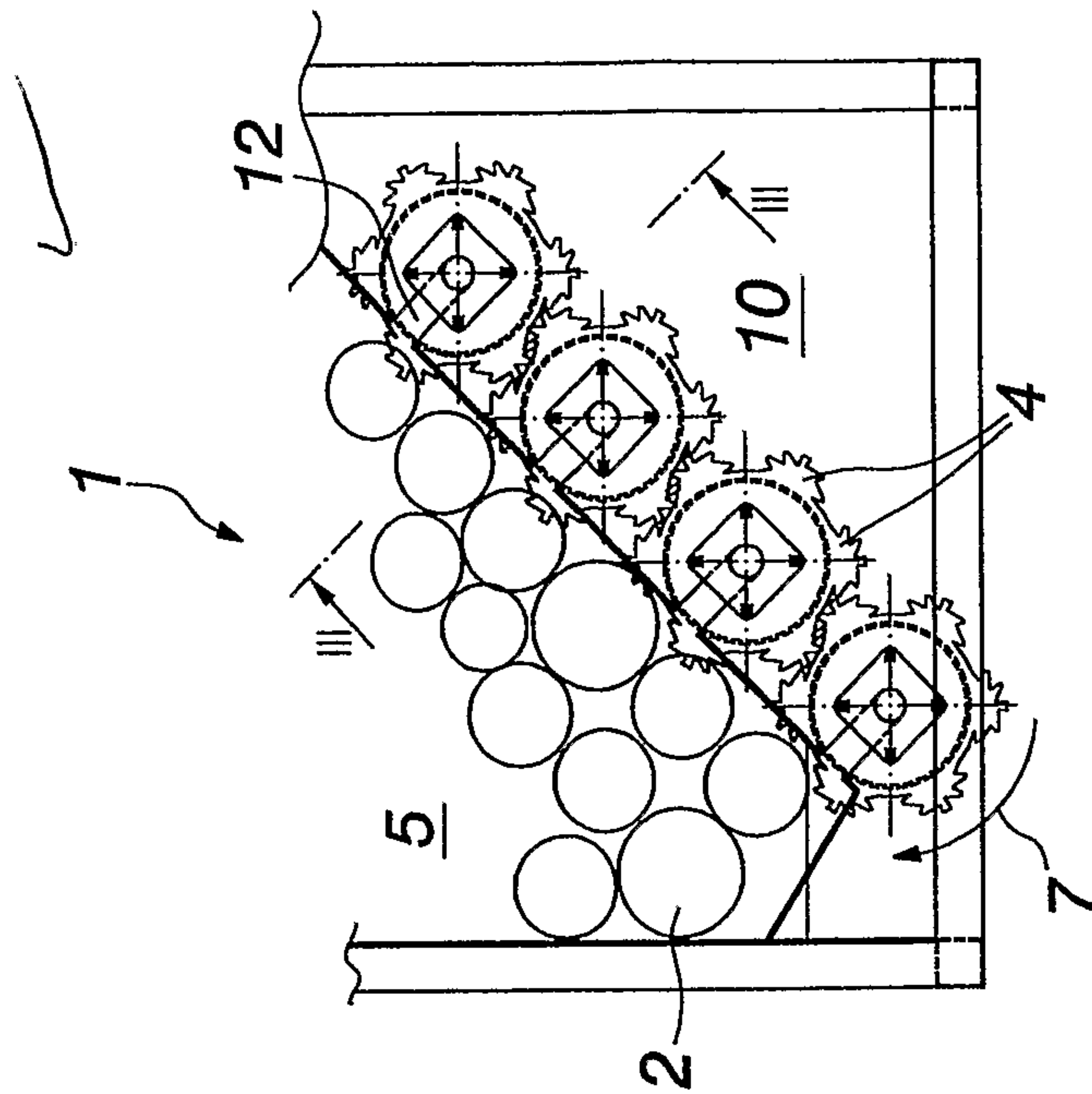


Fig. 2

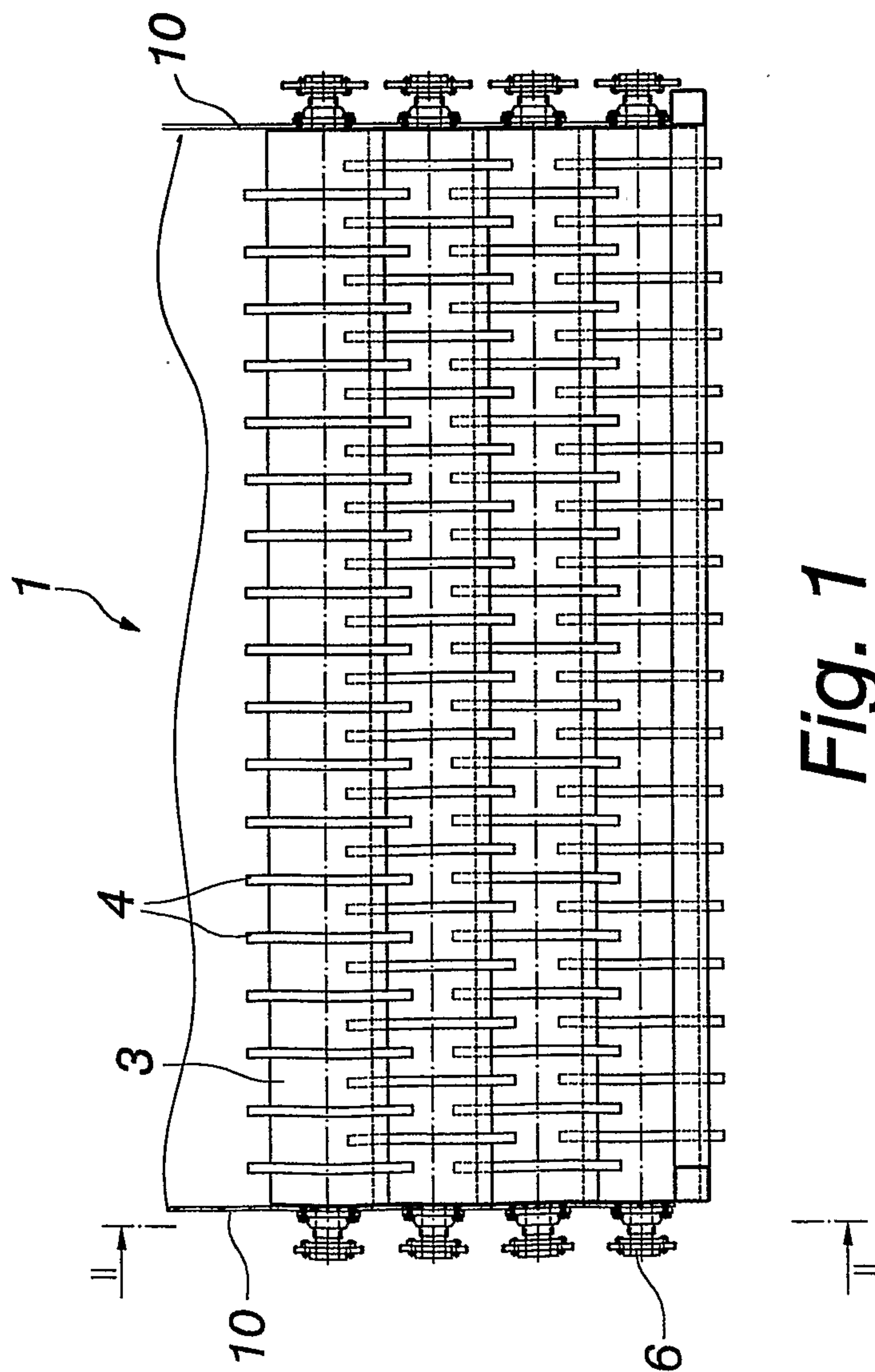
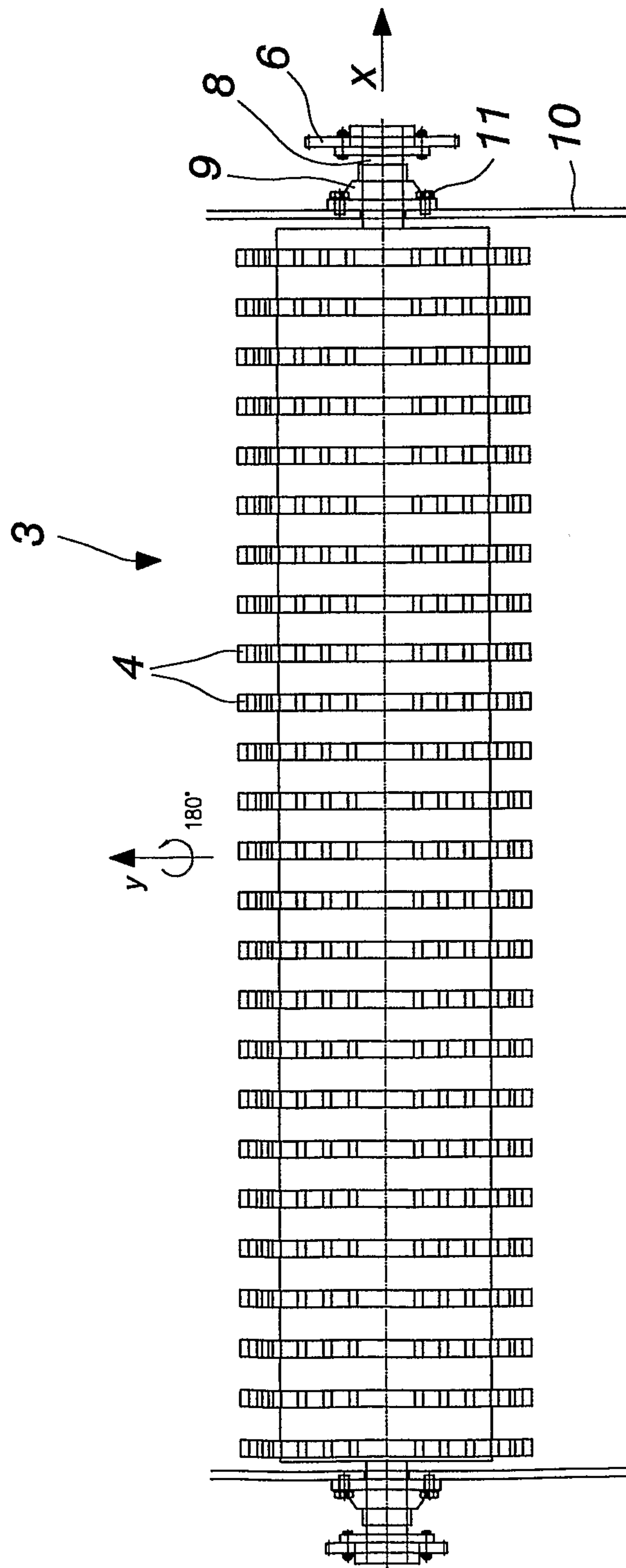


Fig. 1

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**Fig. 3**

