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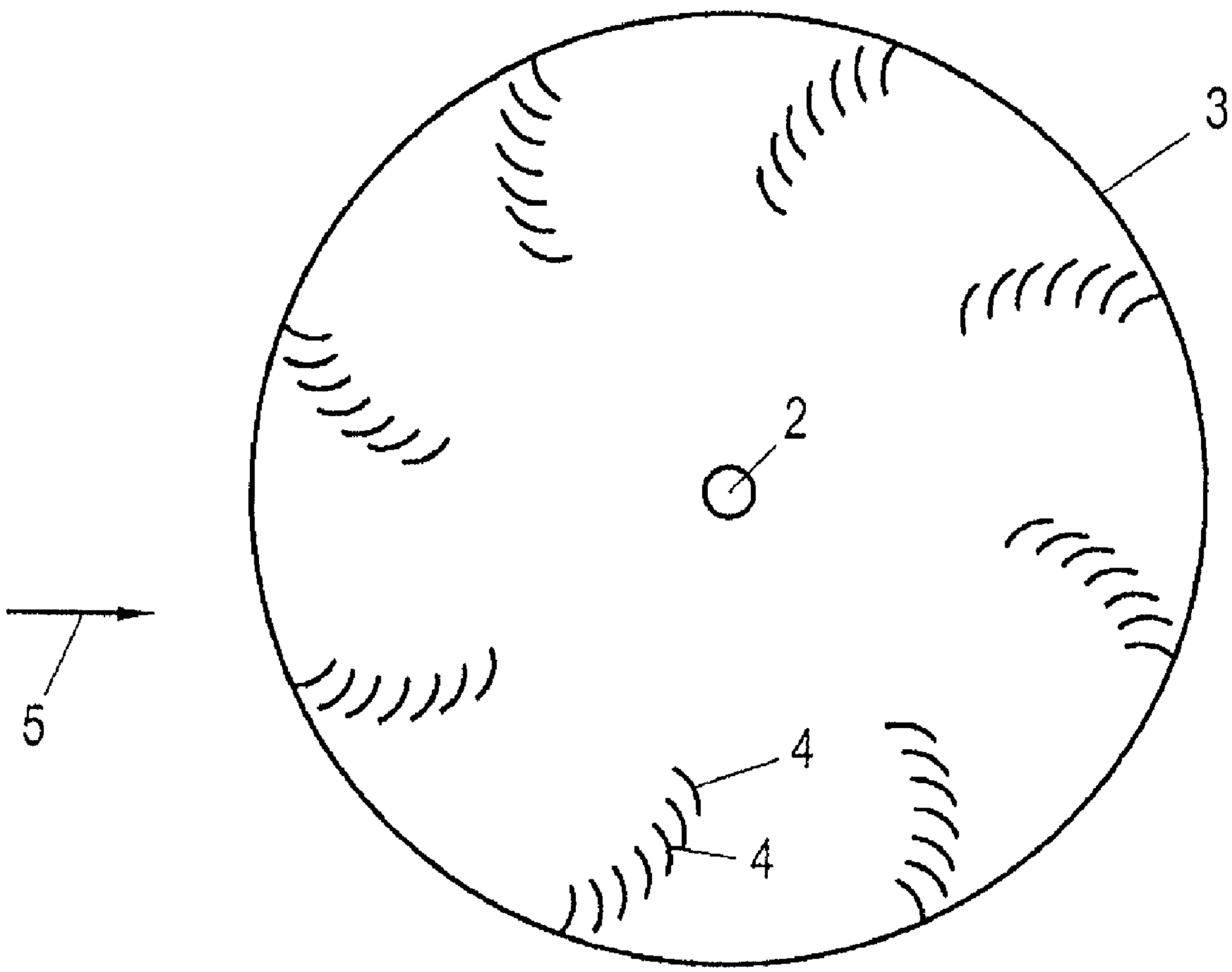
(54) **Titre : PALETTE POUR ROUE A PALETTES**
(54) **Title: BLADE FOR AN IMPELLER WHEEL**



(57) **Abrégé/Abstract:**
Blade for an impeller wheel which is suitable for use for an impeller wheel power station. The special design of the blade ensures relatively low swirling of the water flow behind the blade and increases the utilization of the inflowing water flow as a result.

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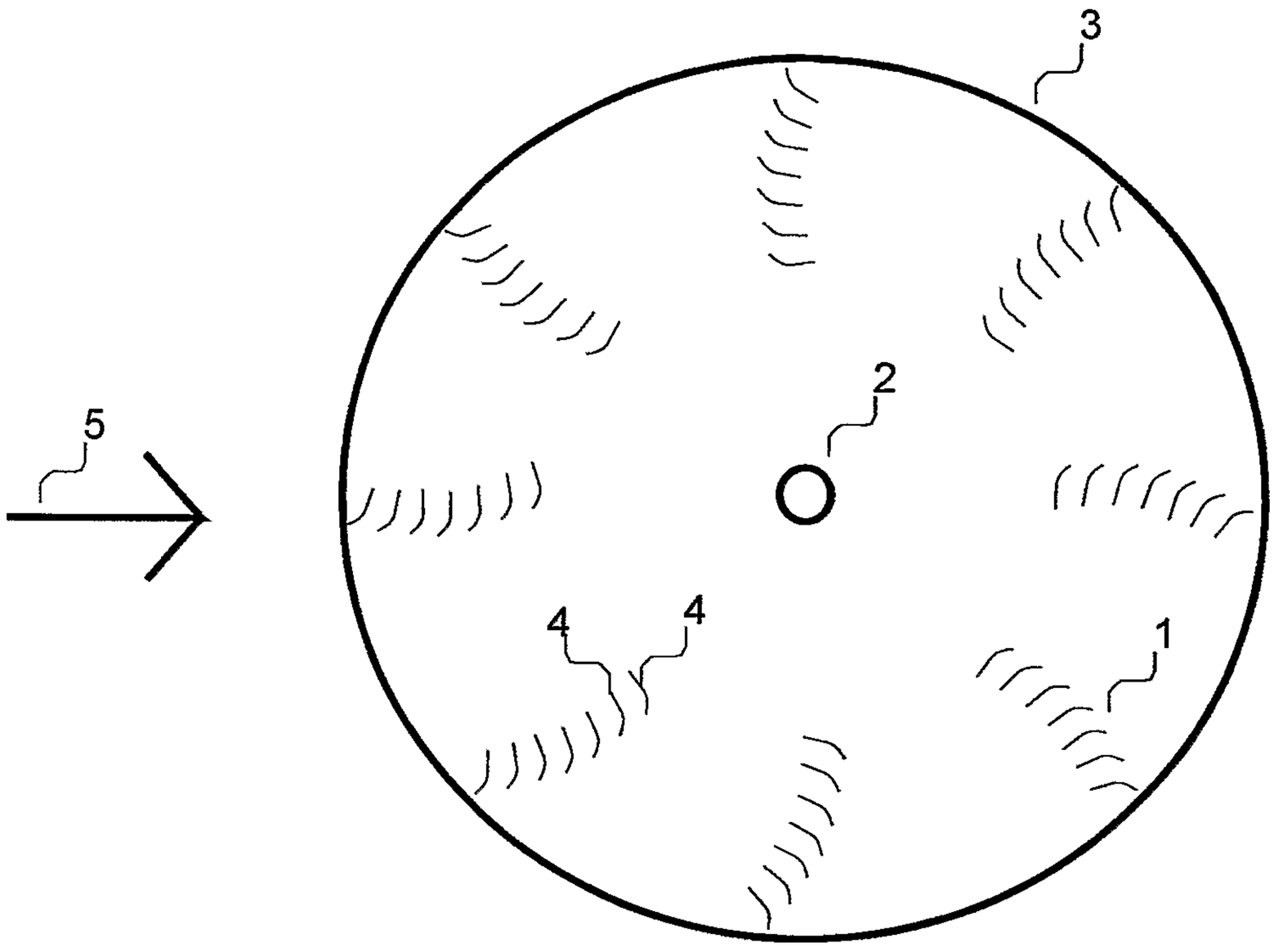
[Fortsetzung auf der nächsten Seite]

(54) Title: BLADE FOR AN IMPELLER WHEEL

(54) Bezeichnung: SCHAUFEL FÜR EIN SCHAUFELRAD



(57) Abstract: Blade for an impeller wheel which is suitable for use for an impeller wheel power station. The special design of the blade ensures relatively low swirling of the water flow behind the blade and increases the utilization of the inflowing water flow as a result.

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Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(57) Zusammenfassung: Schaufel für ein Schaufelrad, welches zur Verwendung für ein Schaufekadkraftwerk geeignet ist. Die besondere Bauform der Schaufel gewährleistet eine geringere Verwirblung des Wasserstroms hinter den Schaufel und erhöht dadurch die Nutzung des anströmenden Wasserstroms.

BLADE FOR AN IMPELLER WHEEL

The invention relates to a blade for an impeller wheel.

One-piece, continuous blades for impeller wheels are known according to prior art. The closed configuration of these known blades causes troublesome turbulence on their back sides.

One aim of the invention is therefore to create a blade for an impeller wheel that achieves an improvement of turbulence on the back sides of the blades.

This aim is solved according to the invention by means of a blade of the type described above, in that the blade comprises at least two elements.

In a preferred embodiment of the invention the elements are separated by intermediate spaces, and/or are arranged like slats.

Another advantage of the invention is that the elements are offset from one another.

In a preferred embodiment the elements have a bend in the incoming flow direction, and are elongated in the discharge flow direction. This bend may be concave or convex.

Another advantage of the invention is that the elements extend at an angle relative to each other.

It may also be advantageous that the angle of the elements become larger outward from a wheel axis.

In a preferred embodiment the spacings between the elements may be equally large.

The invention and all further advantages are explained in further detail below, based on nonlimitative embodiments illustrated in the drawings. Therein:

FIG. 1 is a schematic illustration of a cross-section of an impeller wheel having blades known from prior art;

FIG. 2 is a schematic cross-section of an element according to the invention;

FIG. 3 is a schematic cross-section of an impeller wheel having blades made of the elements according to the invention;

FIG. 4 is a schematic cross-section of an impeller wheel having blades made of the elements according to the invention, and a centerline;

FIG. 5 is a schematic illustration of a cross-section of an alternate impeller wheel having blades made of the elements according to the invention.

FIG. 1 represents the schematic illustration of a section across a known impeller blade 3. According to FIG. 1 an impeller wheel 3 comprises at least one blade 1 and one hub 2.

The schematic illustration in FIG. 2 shows the lateral section of an element 4 according to the invention, both in incoming flow direction, and in discharge flow direction. The incoming flow 5 of the water, and the rotational direction 6 of the impeller wheel are both illustrated. The element 5 may have a bend on its side turned toward the incoming flow of water and may be elongated toward the hub 2, or toward the interior end of the element 4 or can be straight. It has been shown to be of particular advantage, if the bend is concave or convex.

A particular embodiment of the invention is shown in FIG. 3. Multiple blades 1 configured of multiple elements 4 are attached in an impeller wheel 3. By rotating the entire blade 1 about the hub 2 of the impeller wheel 3 the position of the elements 4 relative to the flow is continuously changed. On immersion of the blade 1 (one element 4 after the other) the outermost element 4 has a position having a very low flow resistance. Upon further rotation of the blade 1 the next inner element 4 is also immersed in the flow. At a position perpendicular to the flow the elements 4 almost act like a one-piece blade 1. In other positions of the blade 1 according to the invention the water can flow through the intermediate spaces. These intermediate spaces create slat-like, or blind-like blades 1. Any troublesome turbulence on the back side of the blade 1 is reduced, and any forces counteracting movement of the impeller wheel 3 are reduced. The blade 1 made of multiple elements 4 or the centerline 7 may be either bent or straight.

As shown in FIG. 4, the impeller wheel 3 in the embodiment according to the invention, having the blades 1 configured of elements 4, may be flowed through from both directions 5. Depending on the strength of the flow, it may be necessary to align the blades 1 in an open or closed manner in the flow direction.

FIG. 5 shows a particularly effective embodiment of the present invention. The longitudinal section of a one-piece blade 1 has a centerline 7. This centerline 7 should correspond to the bend of the blade 1. At least two of the elements 4 according to

the present invention are arranged on the centerline 7 such that the angle between the centerline 7 and the first element 4 is smaller than the angle between the centerline 7 and the second element 4. The intersections of the elements 4 and of the centerline 7 may have the same spacing from each other on the centerline 7. However, the spacing may also be different in a modified embodiment. In a particularly effective embodiment the elements 4 may have different sizes. The elements 4 may become smaller from the exterior toward the interior. Thus, the spacing between the elements 4 may also be different accordingly. It has been shown to be particularly effective that the spacing becomes smaller from the exterior toward the interior.

CLAIMS:

1. A paddle wheel rotatable about an axis and exposed to radial inward and crosswise water flow, the paddle wheel having:

a central hub on the axis and about which the wheel is rotated in a rotation direction about the axis; and

a plurality of angularly spaced blades spaced radially outward from the central hub, forming spaces through which water can flow, and each formed by a plurality of radially spaced arcuate elements each in turn having a radially outer end and a radially inner end, the spaced arcuate elements of each blade being concave between the respective ends toward the incoming water flow, the radial outer ends of the spaced arcuate elements of each blade being more widely spaced than the radial inner ends such that each element forms an acute angle with the adjacent element or elements and the spaces between the blades narrow in a direction of flow of water through them, the acute angle each element forms with a centerline through the respective blade increasing toward the hub, each element of each blade being shorter than the adjacent element spaced radially outward therefrom and a spacing between each element and the adjacent element spaced radially outward therefrom decreasing toward the central hub.

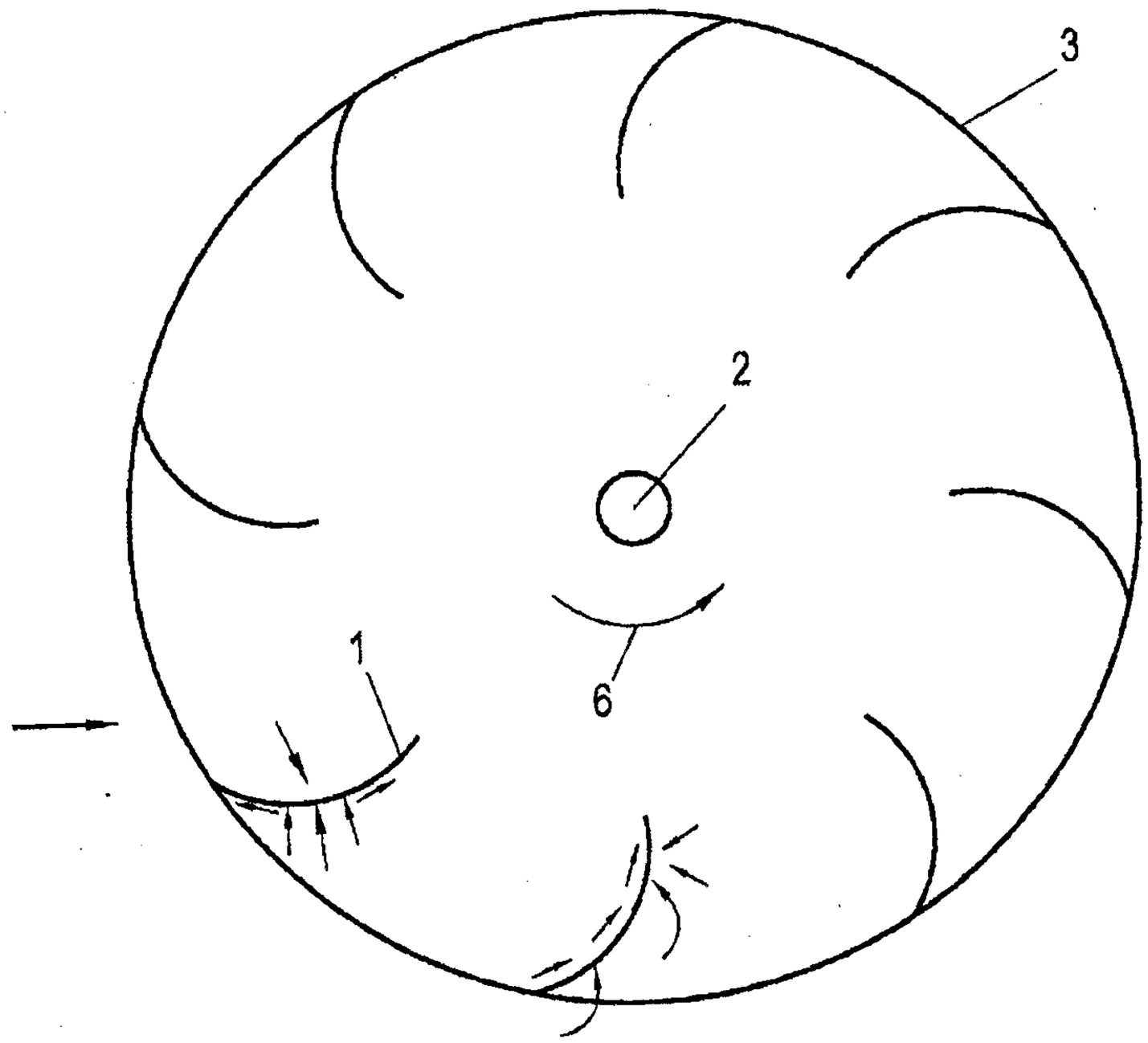


Fig. 1 PRIOR ART

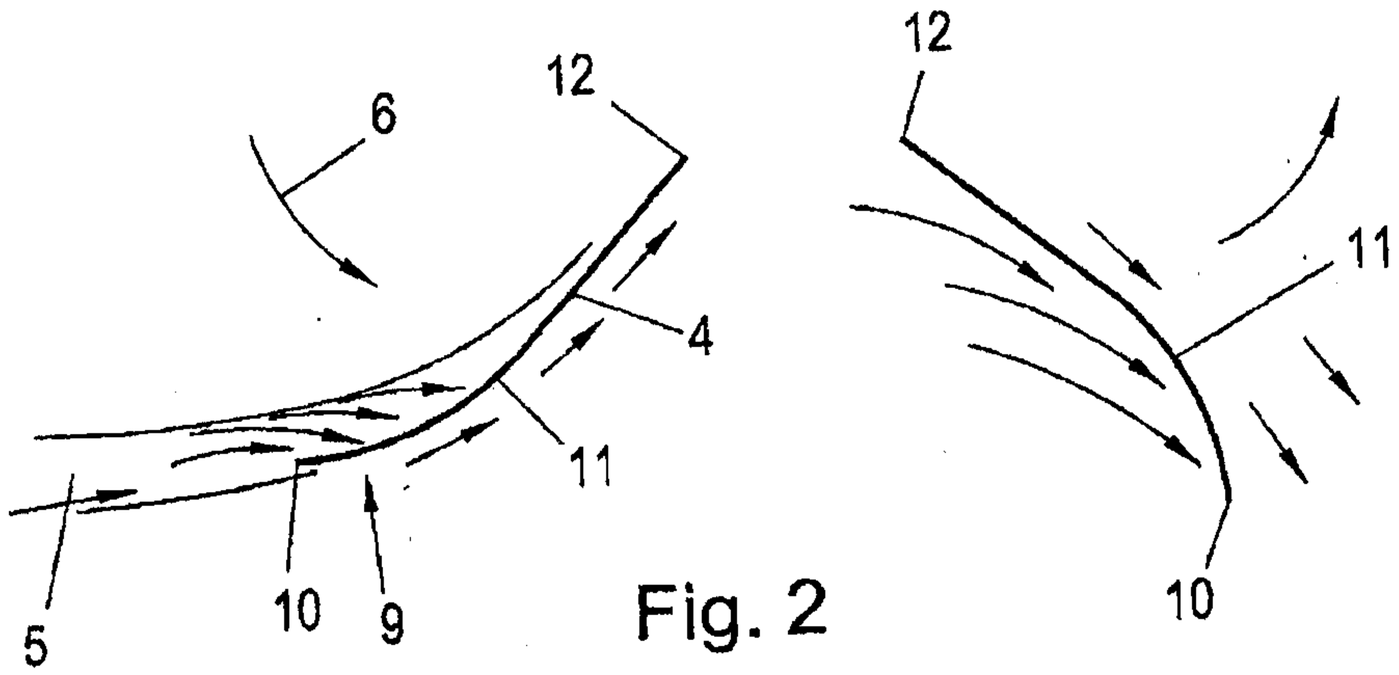


Fig. 2

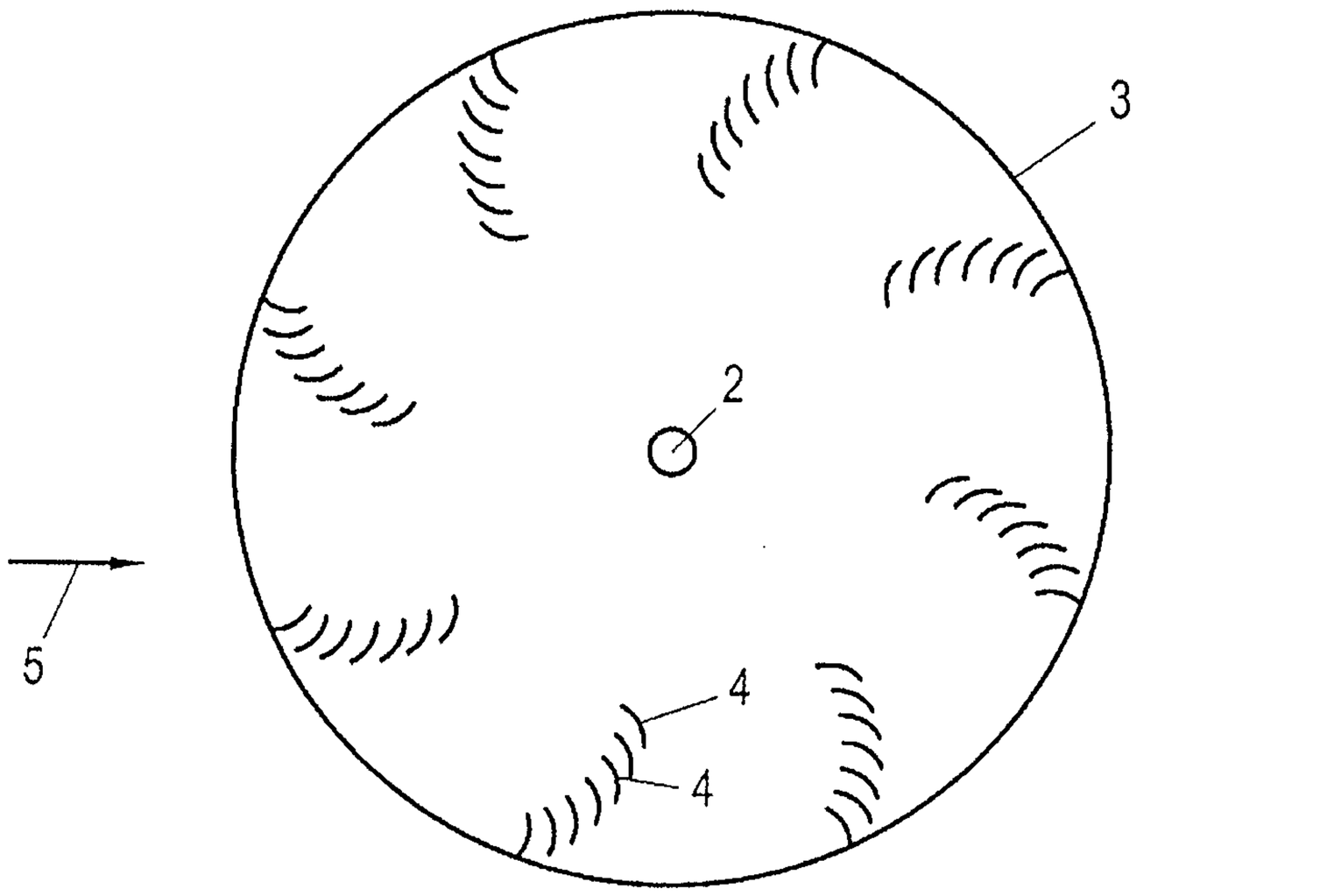


Fig. 3

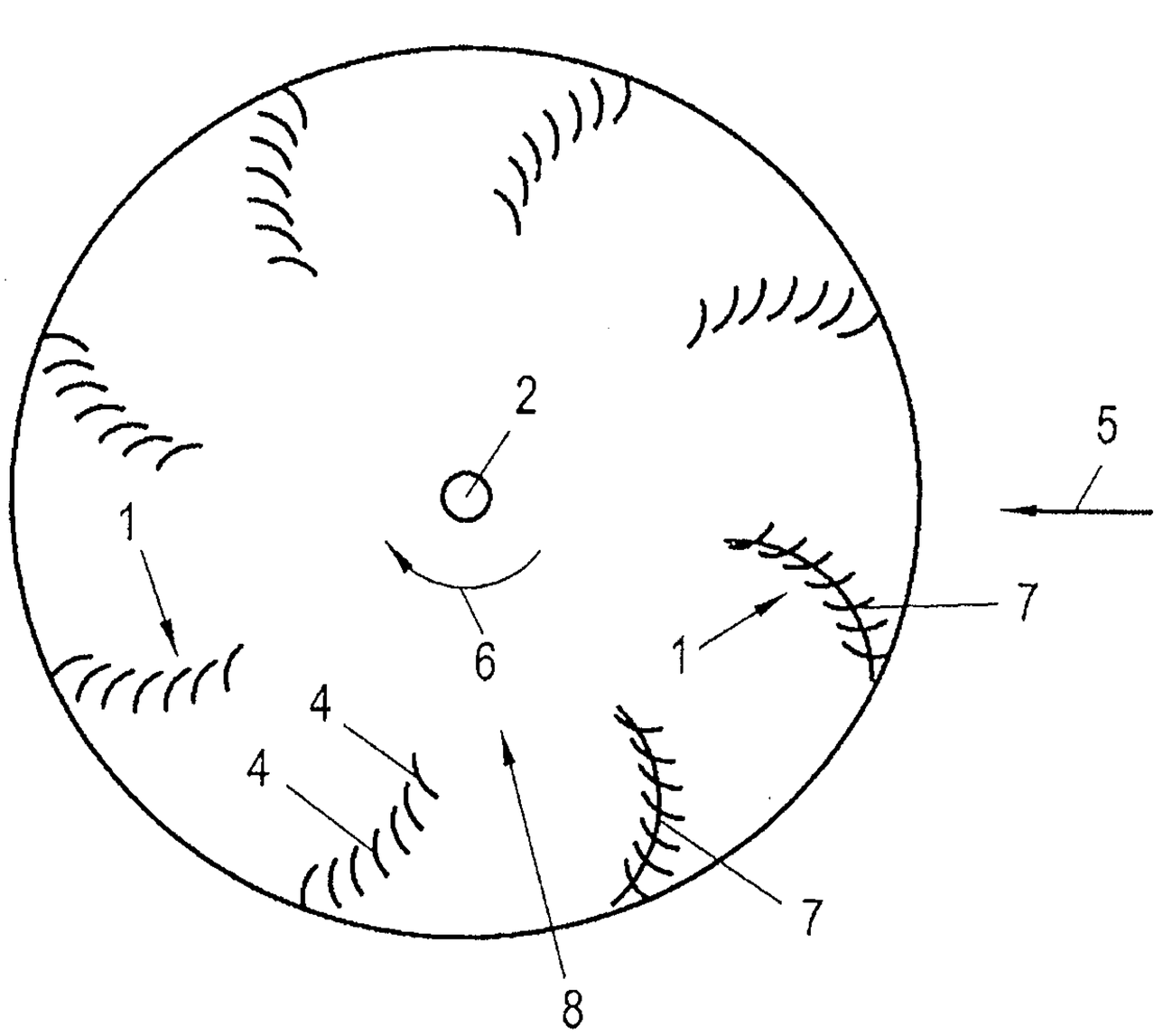


Fig. 4

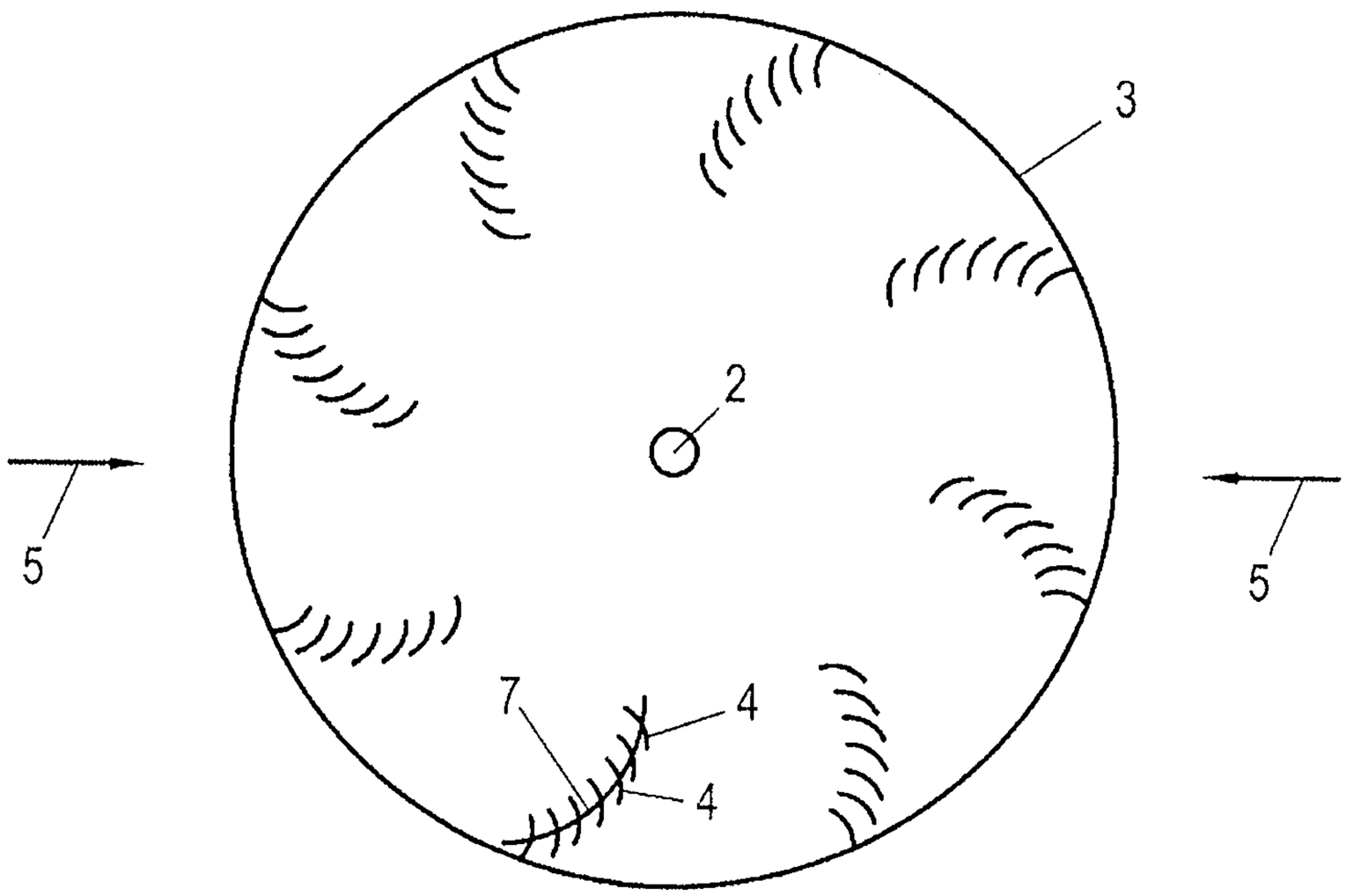
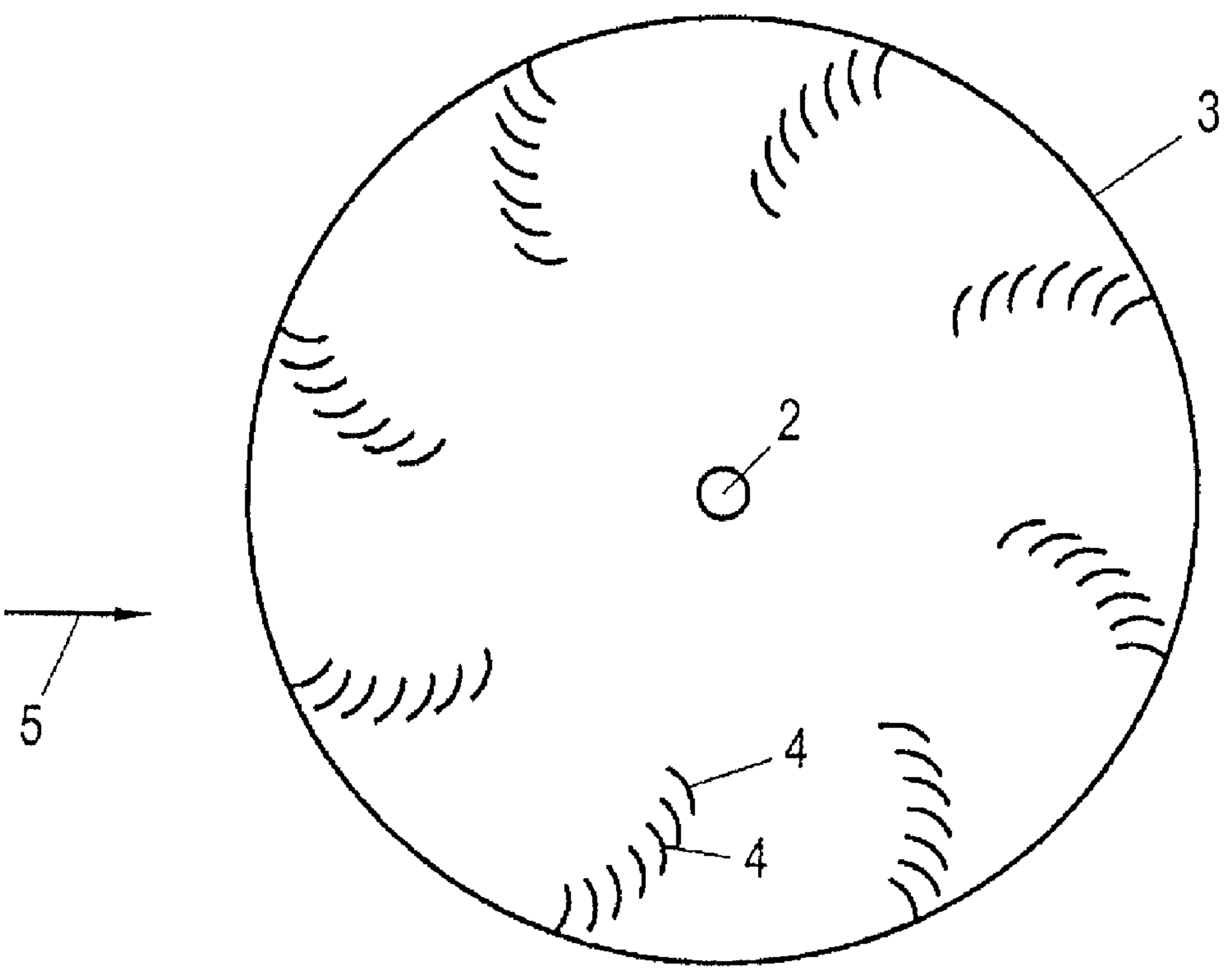


Fig. 5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