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(54) **IMPROVED ABRADING WHEEL**

(57) The present invention discloses an abrading wheel comprising a circular core having an outer periphery, a rim arranged orthogonally to said circular core on said outer periphery, said rim comprising an inner surface and an outer surface, and a grit material disposed on at least part of said outer surface. Further, a plurality of openings are arranged in the core for providing an airflow directed towards the inner surface, and wherein the outer surface of the rim is provided with a plurality of grooves, and where a main part of the grit material is disposed on said outer surface of said rim on spaces between said grooves. Thereby, the abrading wheel is cooled during operation, heat is more easily dissipated, and accumulation of particles from the product being grinded is minimised. Due to the plurality of openings in the circular core, air is forced onto the inner surface of the rim, thereby providing air cooling. Due to the presence of grooves on the outer surface, the surface area of said outer surface is inevitably increased thereby increasing the dissipation of heat and providing additional cooling to the abrading wheel. By disposing a main part of the grit material on spaces between the grooves, said grooves are kept free of grit material thereby minimising the risk of accumulation of material or particles in said grooves. The combination of cooling the abrading wheel and reducing the risk of accumulation of particles further increases the lifetime of said abrading wheel.

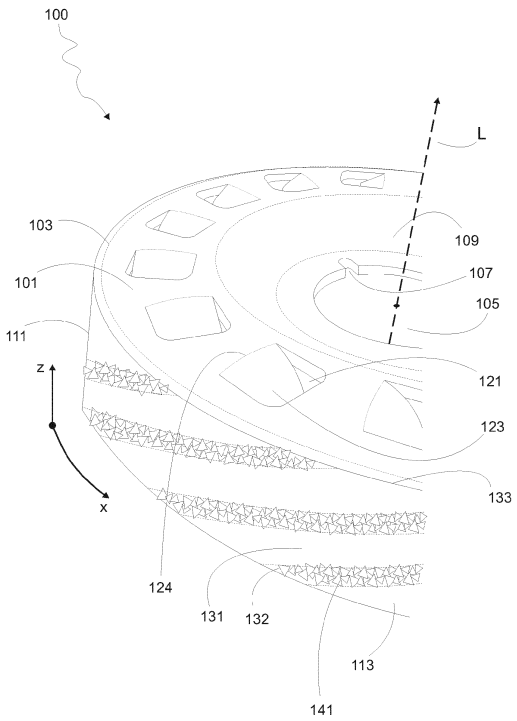

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to abrading wheels. More specifically, the present invention relates to abrading wheels for grinding a product or finishing a surface of a rubber product to form a desired surface smoothness.

BACKGROUND OF THE INVENTION

[0002] Usually, abrading wheels are characterised by their ability to grind products or to tear products apart. For example, such products may be rubber tires or the like, where there is a desire to refurbish or recycle material. A use situation usually involves rotating the abrading wheel at high speed and applying the product to be grinded onto grit disposed onto an outer surface of the abrading wheel. Thereby, the part of the product in contact with the abrading wheel is disintegrated, and the abrading wheel may either be used to smoothen the surface of the remaining part of the product, or the abrading wheel may be used to disintegrate the entire product. However, during such use, several problems are known to occur. The particles from the product being grinded may quickly accumulate in the grit, thereby leaving the abrading wheel useless. In other words, the abrading surface will turn into a smooth surface over time due to the accumulation of particles in the grit. Further, the grit, and the surface onto which said grit is disposed, may heat up due to friction between the abrading wheel and the product being grinded. For example, the products being grinded may behave differently at elevated temperatures or the abrading wheel may attain temperatures exceeding what is considered safe.

[0003] US2002/035890A1 discloses a metal bonded drilling tool which is improved in grinding performance with a long life and can drill a hole in a dry condition without the need for water. The metal bonded drilling tool includes a cylindrical body having an open front end portion, a shank integral with the cylindrical body and having a threaded hole for use in mounting the tool to a rotary tool, and numerous abrasive grains bonded to a front edge of the cylindrical body and to inner and outer cylindrical surfaces of the front end portion of the cylindrical body by a bond member formed primarily of copper alloy.

GENERAL DESCRIPTION

[0004] The object of the invention is to solve some of the above-mentioned problems. This is realised by an abrading wheel comprising a circular core having an outer periphery, a rim arranged orthogonally to said circular core on said outer periphery, said rim comprising an inner surface and an outer surface, and a grit material disposed on at least part of said outer surface, and where a plurality of openings are arranged in said core for providing an airflow directed towards said inner surface, and wherein the outer surface of said rim is provided with a plurality of grooves, and where a main part of said grit material is disposed on said outer surface of said rim on spaces between said grooves.

[0005] By a circular core is meant a unitary, solid, continuous core of metal. Preferably, the circular core is made from steel. Preferably, the core has a thickness ensuring stability when rotating the abrading wheel at operation speeds. The thickness should correspond to the diameter and use of the tool, but may be from 2 to 6 mm. The diameter of the circular core may be between 50 mm and 300 mm, depending on use. An outer periphery is inevitably a part of a circular core as defined. By a rim is meant a ribbon-shaped metal comprising a width greater than the thickness of the circular core and a length equal to the circumference of the outer periphery of said circular core. The width of the rim defines the working width of the abrading wheel. The width of the rim may vary according to the use, but may be at least 20 mm or may be at least 200 mm. However, it should be noted that the width and in fact the entire abrading wheel may be scaled according to the desired use. The rim is mounted along an edge to the outer periphery. Thus, the rim is a circular element mounted onto said outer periphery. By a grit material is meant a material preferably having a hardness substantially higher than the product which the abrading wheel is meant to grind. The grit material constitutes grit. The grit material may be tungsten carbide. The grit material may be formed as small grains comprising a plurality of sharp spikes, or it may be other structures comprising sharp edges capable of grinding products.

[0006] Thereby, the abrading wheel is cooled during operation, heat is more easily dissipated, and accumulation of particles from the product being grinded is minimised. Due to the plurality of openings in the circular core, air is forced onto the inner surface of the rim thereby providing air cooling. Due to the presence of grooves on the outer surface, the surface area of said outer surface is inevitably increased thereby increasing the dissipation of heat and providing additional cooling to the abrading wheel. By disposing a main part of the grit material on spaces between the grooves, said grooves are kept free of grit material thereby minimising the risk of accumulation of material or particles in said grooves. The combination of cooling the abrading wheel and reducing the risk of accumulation of particles further increases the lifetime of said abrading wheel.

[0007] In an embodiment, the circular core may comprise a central axis and a central aperture for mounting the abrading wheel on a rotation tool.

[0008] By a central axis is meant an axis arranged orthogonally to the plane, wherein the outer periphery lies, and where said axis is arranged in the centre of the circular core. Thereby, the central axis is positioned equidistant from the outer periphery of the circular core. By a central aperture is meant a through-going opening arranged in the centre of the circular core. Preferably, the

central aperture is arranged in a displaced depression, said depression being an integral part of the circular core. Preferably, the depression is displaced such that the central aperture is positioned in a position providing the highest amount of stability to the abrading wheel when said abrading wheel is rotating at operational speeds. Such position may be in a central position of the abrading wheel when considering the abrading wheel as a whole, i.e. centrally to the circular hub and midway of the width of the rim.

[0009] Thereby, the abrading wheel may be mounted on a rotation tool and set into rotation around the central axis. The central aperture may have a shape corresponding to a shape of the rotation tool, such that rotation is secure and efficient. Preferably, the central aperture comprises at least one indentation for engaging with a corresponding protrusion on the rotation tool, such that the abrading wheel is fastened securely.

[0010] In an embodiment, the cross section of the grooves may be V-shaped.

[0011] Thereby, the grooves extend into the outer surface of the rim. By the cross section of the grooves being V-shaped, particles are less likely to accumulate in the grooves, since the surface area in the vicinity of the vertex of the groove is minimised compared to other shapes, such as U-shaped grooves.

[0012] In an embodiment, the plurality of grooves may be arranged in a helix having an axis collinear and coinciding with the central axis.

[0013] In an embodiment, the plurality of grooves may be tilted relative to an edge of the rim.

[0014] By an axis of the helix being collinear and coinciding with the central axis, said axes are indistinguishable. Thereby, the grooves are oblique to a normal cutting angle between the product to be grinded and the outer surface of the rim. A normal cutting angle may be defined as the cutting angle, wherein the product to be grinded is applied orthogonally to the outer surface of the rim. That means normal incident of the product to be grinded onto the outer surface of the rim. An oblique cutting angle is efficiently realised when the grooves, and the accompanying intermediate spaces between said grooves, are arranged in a helix-shaped pattern along the circumference of the rim. Alternatively, the grooves may be tilted relative to an edge of the rim, said edge being collinear with the outer periphery of the central core. Thus, when applying said product orthogonally to the outer surface of the rim, a larger amount of grit material disposed on the spaces between the grooves makes impact onto the product to be grinded. In other words, the plurality of grooves arranged in a helix provide clearance for a majority of the grit, i.e. a majority of the grit is arranged aggressively relative to the product to be grinded, such that the efficiency of the grinding process in increased. By being arranged aggressively is meant that shadowing of grains of the grit material is minimised with respect to subsequent grains when the abrading wheel is rotating. In other words, an increased free space is provided for the grit material to come into contact with the product to be grinded. Further, the arrangement of the grooves along the direction of rotation provides an enhanced free flow of particles, such that accumulation in the grit of said particles originating from the product being grinded is minimised. Said free flow of particles causes said particles to be guided away from the abrading wheel along the grooves. In other words, the particles formed from the grinding process are guided in a route given by the arrangement of the grooves, and where said arrangement of grooves are in a helix, the route leads the particles out of the abrading wheel. Thereby, the abrading wheel has an inherent self-clearing effect. In combination with the aggressively arranged grit due to the helix or tilt arrangement, the abrading wheel experiences an increased lifetime.

[0015] In an embodiment, the plurality of grooves may be arranged parallel to each other and parallel to the outer periphery of the circular core.

[0016] By being arranged parallel to each other and parallel to the outer periphery of the circular core, the grooves are arranged orthogonally to the central axis of the abrading wheel, i.e. the central axis of rotation. In such an arrangement, grains of the grit material disposed on spaces between the grooves may be said to shadow subsequent grains of same grit material, i.e. the grinding efficiency of the abrading wheel is lowered which may be desired in certain use.

[0017] Thereby, the resistance between the grit and product to be grinded is reduced. That means that due to the grooves and accompanying spaces with grit material being aligned to the normal cutting angle, a smaller amount of grit material is exposed to the product to be grinded at a given time. Thus, the resistance is reduced which may be useful for certain products or situations.

[0018] In an embodiment, the rim may be a ribbon mounted onto the outer periphery of the circular core along an edge of said ribbon.

[0019] By a ribbon is meant a primarily rectangular piece of material bent to fit the outer periphery of the circular core. Thus, the ribbon comprises two side edges and two end edges, said end edges being joined to form a circular ribbon. One of said side edges are mounted on the outer periphery of the circular core, such that the abrading wheel resembles a bowl.

[0020] Thereby, the thickness of the circular core may be smaller than the width of the rim, such that the inner surface of the rim is exposed to air. It is noted that the mounting may be through welding, or the mounting may be through means of pressing, stamping, or casting the abrading wheel in a single piece.

[0021] In an embodiment, a tongue may be attached to each opening of the circular core, a plurality of tongues thereby being arranged in said circular core.

[0022] In an embodiment, the tongues may be formed from excess material bent away from the opening, the tongues thereby being an integral part of the circular core.

[0023] In an embodiment, the tongues are oriented

such that air is forced onto the inner surface of the rim, thereby providing air cooling to the abrading wheel.

[0024] By a tongue is meant a partially free piece of material freed from the circular core. Thus, a tongue and an opening may be formed simultaneously by making appropriate cuts in the circular core, followed by bending an uncut edge away from the plane of the circular core. Thereby, the tongue is attached to the circular core through the bow and may therefore be considered an integral part of the circular core. Thus, the openings may be said to comprise integrated tongues. The tongues may be said to be cooling tongues. The tongues may be regarded as wings. Preferably, the plurality of tongues are bent towards an inner volume partly defined by the inner surface of the rim and the circular core. Preferably, the tongues are arranged in a homogenous pattern, such that the tongues are positioned identically relative to the opening for all openings provided in the circular core. Preferably, the openings are quasi-quadratic and the uncut edge is oriented orthogonally to the outer periphery of the circular hub.

[0025] Thereby, passive means for guiding an air flow onto the inner surface of the rim is realised. By passive means is meant that said air flow is pulled into the abrading wheel and guided onto the inner surface of the rim by the combination of high rotation speed of the abrading wheel and the orientation of the tongues. Said orientation of the tongues is chosen to maximise the air flow onto the inner surface of rim during high speed rotation of the abrading wheel. Thereby, the passive means for guiding an air flow onto the inner surface of the rim provides passive cooling means of the abrading wheel. Thereby, said passive cooling means causes a lower working temperature of the abrading wheel.

[0026] In an embodiment, the grit material may form an overhang above said grooves.

[0027] By an overhang is meant that free space is provided between the outer surface of the rim and parts of the grit material disposed primarily on the spaces between the grooves.

[0028] Thereby, the combined surface area of grit material exposed to the surroundings is increased compared to a situation where no overhang is provided. Thus, when using the abrading wheel for grinding a product, a larger part of said product may be in contact with the grit thereby increasing the efficiency of the abrading wheel. Further, the amount of grit may be increased by allowing an overhang while maintaining the presence of grit-free grooves for avoiding accumulation of particles as described earlier. Moreover, an increased surface area of grit material results in an increased amount of heat dissipation thereby increasing the cooling abilities of the abrading wheel.

[0029] In an embodiment, the grit material may be tungsten carbide.

[0030] Thereby, the grit material has a hardness superior to most materials which it is expected to grind. Materials possessing similar hardness, such as silicon carbide, are foreseen within the scope of the invention.

[0031] In an embodiment, the grit size may be between 14 and 220.

[0032] The grit size disclosed is standardised according to Federation of European Producers of Abrasives (FEPA). A grit size of 14 corresponds to a particle size (mean diameter) of 1.47 mm, and a grit size of 220 corresponds a particle size (mean diameter) of 0.058 mm.

[0033] Thereby, the grit may be varied according to use and the desired smoothness of the grinded product.

[0034] In an embodiment, the abrading wheel may be mounted onto a rotation tool, said rotation tool being capable of providing rotation around a central axis of the abrading wheel.

[0035] Preferably, the mounting is done by engaging a rotational part of the rotation tool in the central aperture and the indentation, where said central aperture and indentation corresponds to the dimension of the rotational tool and a protrusion in said rotational part, respectively. Thereby, the abrading wheel may be set in an efficient and secure rotation.

SHORT LIST OF THE DRAWINGS

[0036] In the following, example embodiments are described according to the invention, where

Fig. 1 illustrates a perspective view of an abrading wheel according to the invention.

Fig. 2 illustrates a second perspective view of an abrading wheel according to the invention.

Fig. 3 illustrates a top view of an abrading wheel according to the invention.

Fig. 4 illustrates a plurality of cross-sectional views of an abrading wheel according to the invention.

Fig. 5 illustrates an example of an outer surface of an abrading wheel according to the invention.

Fig. 6 illustrates a second example of an outer surface of an abrading wheel according to the invention.

Fig. 7 illustrates a close up cross-sectional view of a groove in an outer surface on an abrading wheel according to the invention.

DETAILED DESCRIPTION OF DRAWINGS

[0037] In the following, the invention is described in detail through embodiments thereof that should not be thought of as limiting to the scope of the invention.

[0038] Fig. 1 is a perspective view of a part of an abrading wheel 100 according to the invention. The abrading wheel 100 comprises a circular core 101 having an outer periphery 103 and a central aperture 105. Said central aperture 105 is arranged in a depression 109. Said de-

pression 109 protrudes into an inner volume (not shown) partly defined by said circular core 101 and a rim 111 arranged orthogonally to said core 101 on said outer periphery 103. Thus, the abrading wheel 100 may be said to be bowl-shaped with a central depression 109. Preferably, the depression 109 is an integral part of the core 101 therefore being considered as part of the core 101 in this context. Preferably, the central aperture 105 comprises at least one indentation 107 for mounting the abrading wheel 100 securely onto a rotation tool (not shown). The indentation 107 may be formed to correspond to a protrusion on said rotation tool (not shown). Said rotation tool may be used to rotate the abrading wheel 100 around a central axis L by engaging with the central aperture 105 and the at least one indentation 107. The rim 111 may be either mounted through e.g. welding onto the outer periphery 103 of the core 101, or the combined rim 111 and core 101 may be formed from a single piece of material, such that the outer periphery 103 is formed when bending/stamping said single piece of material. Alternatively, the core 101 and rim 111 are formed in a casting process. The core 101 is equipped with a plurality of openings 121. Preferably, said openings 121 are arranged equiangularly in a circular pattern at a fixed distance from a centre point of the central opening 105. The openings 121 are equipped with tongues 123, said tongues 123 preferably being an integral part of the core 101 and formed from bending the material along an uncut edge 124. For example, the openings 121 may be rectangular, such that the tongues 123 are formed from cutting along three edges thus leaving a fourth edge uncut and thereby allowing said fourth edge to be bent. Preferably, the tongues 123 are bent towards the inner volume (not shown). Preferably, the tongues 123 are bent evenly for all openings 121, such that a homogenous pattern of the openings 121 and tongues 123 is formed. When the abrading wheel 100 is set into rotation by a rotation tool, the tongues and accompanying openings draw in an air flow, such that said air is forced onto an inner surface (not shown) of the rim 111. Thereby, said air flow provides air cooling of the abrading wheel. Air cooling is essential when using the abrading wheel 100 for grinding purposes, where heating may occur due to friction.

[0039] The rim 111 is arranged orthogonally to the plane of the core 101, i.e. the rim extends in a direction parallel to the central axis L. The rim comprises an outer surface 113 and an inner surface (not shown). The inner surface is oriented towards the inner volume (not shown) of the abrading wheel 100 partly defined by the core 101 and the rim 111. The outer surface 113 comprises a plurality of grooves 131, for example carved into said outer surface. Said plurality of grooves 131 twists around the central axis L. Preferably, the grooves 131 are arranged in a helix with an axis collinear and coinciding with the central axis L. The helix and the grooves 131 sketched in Fig. 1 are highly exaggerated. Alternatively, the grooves 131 are parallel to each other and to the outer periphery 103 of the core 101. Alternatively, the grooves 131 are tilted relative to the outer periphery 103. Between said grooves 131, intermediate protruding spaces 132 are formed, said spaces 132 inevitably having the same course, e.g. a helix, as the grooves 131. A grit material 141 is disposed primarily onto said spaces 132 thereby leaving the grooves 131 free of grit material 141. See Fig. 5a and Fig. 6a for a cross-sectional view of the grooves 131, the spaces 132 and the disposed grit material 141. Said grit material 141 is made from a hard material such as tungsten carbide having a hardness of 9 on the Mohs-scale. When the abrading wheel 100 is set into rotation and a product is applied onto the grit, the grit material 141 grinds said product. Due to the absence of grit material 141 in the grooves 131, particles grinded off the applied product are less likely to accumulate in the grooves thereby increasing the lifetime of the abrading wheel 100. In otherwords, particles entering the grooves 131 are free to move and eventually escape said grooves 131, contrary to the case wherein grit material 141 would be disposed in the grooves 131, whereby particles would get trapped and accumulate more easily.

[0040] By arranging the grooves 131 and accompanying intermediate spaces 132 in a helix or tilted relative to the outer periphery 103, a larger amount of grit material 141 makes contact with the product to be grinded at any given time during rotation of the abrading wheel 100, assuming the product makes normal incident onto the rim 111. In other words, the helix arranged or tilted grooves 131 and spaces 132 provide an increased free space for a product making contact to the grit material 132 disposed in the spaces 132. Thus, by the grooves 131 and accompanying spaces 132 being tilted or arranged in a helix, the grinding efficiency of the abrading wheel 100 is increased.

[0041] A further effect of the grooves 131 and the accompanying intermediate spaces 132 being arranged in a helix or tilted relative to the outer periphery 103 is that the particles formed by grinding a product on the abrading wheel 100 are guided out of the abrading wheel. In other words, grooves 131 arranged in a helix or tilted inevitably comprise ends 133 terminating along an edge of the rim 111, where said ends 133 allow the particles to escape the abrading wheel 100.

[0042] The presence of grooves 131 further increases the surface area of the abrading wheel 100 which in turn increases the dissipation of heat and thereby increases the cooling capabilities of said abrading wheel 100.

[0043] Fig. 2 is a perspective view of the part of the abrading wheel 100 of Fig. 1 shown from another angle. In this view, the inner volume partly defined by the core 101 and the rim 111 is exposed. The inner surface 115 of the rim is shown in this view. The depression 109 protrudes into said inner volume. The central aperture 105 and the indentation 107 are partly visible. The tongues 123 are shown to be bent into the inner volume along an uncut edge 124. Further, the openings 121 are shown to be cut along three edges 221, 222, 223, thereby leaving

the uncut edge 124 uncut. The tongues 123 are all bent along the same uncut edge 124 relative to the core 101 thereby forming a homogenous pattern along the entire diameter along which the openings 121 are arranged. Preferably, the uncut edge 124 is orthogonal to the rim 111. A grit material 141 is disposed on spaces between a plurality of grooves (not shown in this embodiment) on the outer surface 113 of the rim 111. The grit material 141 is shown in further detail in Fig. 5 and Fig. 6.

[0044] Fig. 3 shows a top view of the abrading wheel 100. The top view exposes the inner volume. The direction of the central axis L serves as reference to Fig. 1. The plurality of openings 121 is shown without tongues 123. However, it should be noted that in the case of said tongues 123 being an integral part of the core 101, it is not optional to detach or attach said tongues 123. The plurality of openings 121 is shown to be equiangularly spaced on the core 101 around the central axis L. The central aperture 105 is shown to be arranged symmetrically around the central axis L. The abrading wheel 100 is shown with two indentations 107, 107', for improved stability when mounting the abrading wheel onto a rotation tool (not shown). The depression 109 is indicated by a dotted line. The grit material 141 is shown disposed on an outer surface 113 of the rim 111. Three cross sections, A-A, B-B, and C-C, are indicated in Fig. 4 and described in further detail below.

[0045] Fig. 4 shows the cross sections indicated in Fig. 3.

[0046] Fig. 4a illustrates the cross section A-A comprising two of the plurality of openings 121. The tongues 123 are shown to be an integral part of the core 101 and being bent along an uncut edge 124 indicated by a dotted line.

[0047] Fig. 4b illustrates the cross section B-B. The tongue 123 attached to the opening 121 is shown as a displaced dotted box due to the choice of viewing angle. The rim 111 is shown being arranged orthogonally to the core 101. An edge of the rim 101 is shown to be mounted onto the outer periphery 103 of the core 101, the rim 111 thereby forming an acute angle of 90 degrees and an obtuse angle of 270 degrees relative to the core 101. The rim 111 comprises a plurality of grooves 131 arranged in the outer surface 113. The plurality of grooves 131 are separated by a plurality of spaces 132. A grit material 141 is disposed onto said spaces 132.

[0048] Fig. 4c illustrates the cross section C-C. The abrading wheel is rotationally symmetric around the central axis L. The direction of the central axis L corresponds to the direction given from Fig. 1. The depression 109 protrudes towards the inner volume partly formed by the core 101 and the rim 111. More specifically, the depression 109 displaces the central aperture 105 towards a midway point defined from the width of the rim 111. Thereby, stability of the abrading wheel 100 is increased when said abrading wheel 101 is exposed to rotational forces.

[0049] Fig. 5 and Fig. 6 show two possible excerpts of the outer surface 113. For reference, the orientation of the excerpts relative to the rim 111 is indicated by the directions x and z which are further defined in Fig. 1. A cross view of each excerpt is shown in Fig. 5a and Fig 6a. The excerpts are examples of possible arrangements of the grooves 131 and accompanying spaces 132 thereby not limiting the scope of the invention.

[0050] Fig. 5 illustrates an excerpt of an outer surface 113 comprising a large separation of grooves 131, i.e. large spaces 132. Further, the grooves 131 and the accompanying spaces 132 are tilted at an angle 1 relative to the x-direction. The tilt forms a helix along the circumference of the rim 111 and around an axis coinciding with the central axis L (not shown). The grit material 141 is disposed on the spaces 132, such that the grooves 131 are free of grit material 141. A shaded triangle indicates a possible impact area 150 for a product to be grinded by the abrading wheel 100. During rotation, a product making normal incident, i.e. "entering" the grit from the short cathetus 150a, as shown by the direction of the arrow E, makes impact with the grit material 141 along the entire length of the hypotenuse 150c. In the case of non-tilted grooves 131 and spaces 132, the impact would be reduced to the width of the spaces 132 onto which the grit material 141 is disposed. Thereby, said impact area 150 illustrates the increased efficiency of the abrading wheel 100, when the grooves 131 and accompanying spaces 132 are arranged in a helix or tilted.

[0051] Fig. 5a illustrates a cross-sectional view of the excerpt in Fig. 5. Preferably, the grooves 131 are V-shaped as illustrated. Preferably, the grit material 141 overhangs parts of the grooves 131 illustrated by the overhang 142.

[0052] Fig. 6 and Fig. 6a (cross-sectional view) illustrate an excerpt of an outer surface 113 comprising a small separation of grooves 131, i.e. narrow spaces 132. Further, the tilt given by the angle 1 is smaller than the excerpt illustrated in Fig. 5.

[0053] Fig. 7 illustrates a close-up cross-sectional view of a V-shaped groove 131 and grit material 141 disposed primarily on intermediate spaces 132 between said grooves 131. It is noted how an overhang 142 of grit material 141 is formed, such that free space is provided between the slopes of the groove and said grit material 141.

REFERENCE NUMBERS

[0054]

E	Entering direction of product
L	Central axis
1	Angle relative to x-direction
100	Abrading wheel
101	Circular core
103	Outer periphery
105	Central aperture
107	Indentation

109	Depression
111	Rim
113	Outer surface
115	Inner surface
121	Openings
123	Tongues
124	Uncut edge
131	Grooves
132	Spaces
133	End of groove 131
141	Grit material
142	Overhang
150	Impact area
150a	Cathetus
150c	Hypotenuse
221	Edge
222	Edge
223	Edge

[0055] The invention is summarized in the following sentences #1-#14. The sentences shall not limit the invention in any way:

#1 An abrading wheel comprising

- a circular core (101) having an outer periphery (103),
- a rim (111) arranged orthogonally to said circular core on said outer periphery, said rim comprising an inner surface (115) and an outer surface (113), and
- a grit material (141) disposed on at least part of said outer surface (113),

characterised **in that** a plurality of openings (121) are arranged in said core (101) for providing an airflow directed towards said inner surface (115), and wherein the outer surface (113) of said rim (111) is provided with a plurality of grooves (131) twisting around a central axis (L) of the abrading wheel and arranged in a helix or tilted relative to the outer periphery (103), and where a main part of said grit material (141) is disposed on said outer surface of said rim on spaces (132) between said grooves, whereby particles formed from a product being grinded are guided away from the abrading wheel along said grooves.

#2 An abrading wheel as described under #1, wherein the circular core comprises a central axis and a central aperture for mounting the abrading wheel on a rotation tool.

#3 An abrading wheel as described under #1 and #2, wherein the cross section of the grooves is V-shaped.

#4 An abrading wheel according to any of sentences #1 - #3 as described above, wherein the plurality of grooves are arranged in a helix having an axis collinear and coinciding with the central axis.

#5 An abrading wheel according to any of sentences #1 - #4, wherein the plurality of grooves are tilted relative to an edge of the rim.

#6 An abrading wheel according to any of sentences #1 - #5, wherein the plurality of grooves are arranged parallel to each other and parallel to the outer periphery of the circular core.

#7 An abrading wheel according to any of sentences #1 - #6, wherein the rim is a ribbon mounted onto the outer periphery of the circular core along an edge of said ribbon.

#8 An abrading wheel according to any of sentences #1 - #7, wherein a tongue is attached to each opening of the circular core, a plurality of tongues thereby being arranged in said circular core.

#9 An abrading wheel according to any of sentences #1 - #8, wherein the tongues are formed from excess material bent away from the openings, the tongues thereby being an integral part of the circular core.

#10 An abrading wheel according to any of sentences #1 - #9, wherein the tongues are oriented such that air is forced onto the inner surface of the rim, thereby providing air cooling to the abrading wheel.

#11 An abrading wheel according to any of sentences #1 - #10, wherein the grit material forms an overhang above said grooves.

#12 An abrading wheel according to any of sentences #1 - #11, wherein the grit material is tungsten carbide

#13 An abrading wheel according to any of sentences #1 - #12, wherein the grit size is between 14 and 220.

#14 An abrading wheel according to any of sentences #1 - #13, wherein said abrading wheel is mounted onto a rotation tool, said rotation tool being capable of providing rotation around a central axis of the abrading wheel.

Claims

1. An abrading wheel comprising

- a circular core (101) having an outer periphery (103),

- a rim (111) arranged orthogonally to said circular core on said outer periphery, said rim comprising an inner surface (115) and an outer surface (113), and
- a grit material (141) disposed on at least part of said outer surface (113) and being arranged aggressively,

characterised in that a plurality of openings (121) are arranged in said core (101) for providing an airflow directed towards said inner surface (115), and wherein the outer surface (113) of said rim (111) is provided with a plurality of grooves (131), and where a main part of said grit material (141) is disposed on said outer surface of said rim on spaces (132) between said grooves.

2. An abrading wheel according to claim 1, wherein the circular core comprises a central axis and a central aperture for mounting the abrading wheel on a rotation tool.

3. An abrading wheel according to claims 1 and 2, wherein the cross section of the grooves are V-shaped.

4. An abrading wheel according to any of the preceding claims, wherein the plurality of grooves are arranged in a helix having an axis collinear and coinciding with the central axis.

5. An abrading wheel according to any of the preceding claims, wherein the plurality of grooves are tilted relative to an edge of the rim.

6. An abrading wheel according to any of the preceding claims, wherein the plurality of grooves are arranged parallel to each other and parallel to the outer periphery of the circular core.

7. An abrading wheel according to any of the preceding claims, wherein the rim is a ribbon mounted onto the outer periphery of the circular core along an edge of said ribbon.

8. An abrading wheel according to any of the preceding claims, wherein a tongue is attached to each opening of the circular core, a plurality of tongues thereby being arranged in said circular core.

9. An abrading wheel according to any of the preceding claims, wherein the tongues are formed from excess material bent away from the openings, the tongues thereby being an integral part of the circular core.

10. An abrading wheel according to any of the preceding claims, wherein the tongues are oriented such that air is forced onto the inner surface of the rim, thereby providing air cooling to the abrading wheel.

11. An abrading wheel according to any of the preceding claims, wherein the grit material forms an overhang above said grooves.

12. An abrading wheel according to any of the preceding claims, wherein the grit material is tungsten carbide

13. An abrading wheel according to any of the preceding claims, wherein the grit size is between 14 and 220.

14. An abrading wheel according to any of the preceding claims, wherein said abrading wheel is mounted onto a rotation tool, said rotation tool being capable of providing rotation around a central axis of the abrading wheel.

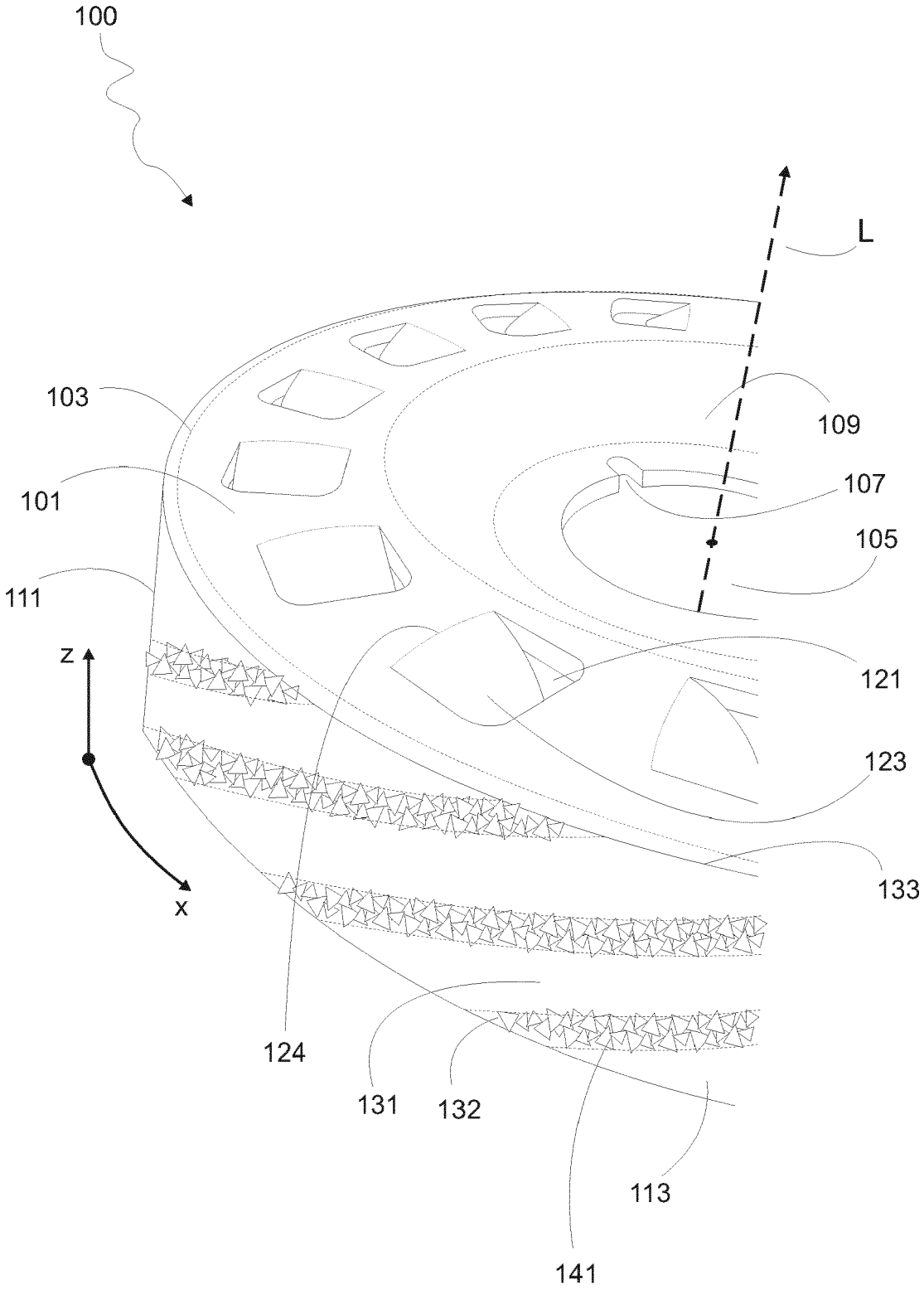

Fig. 1

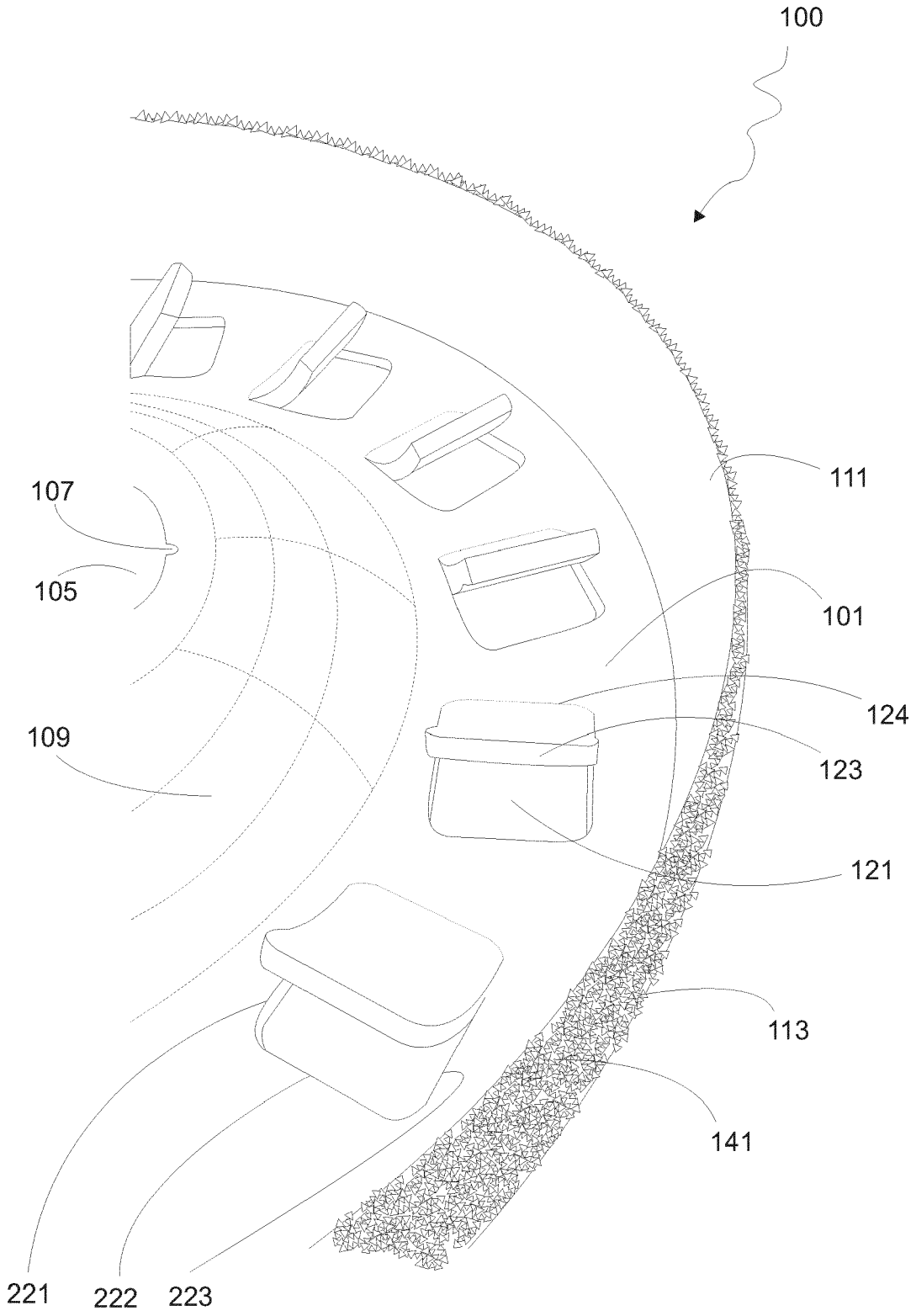

Fig. 2

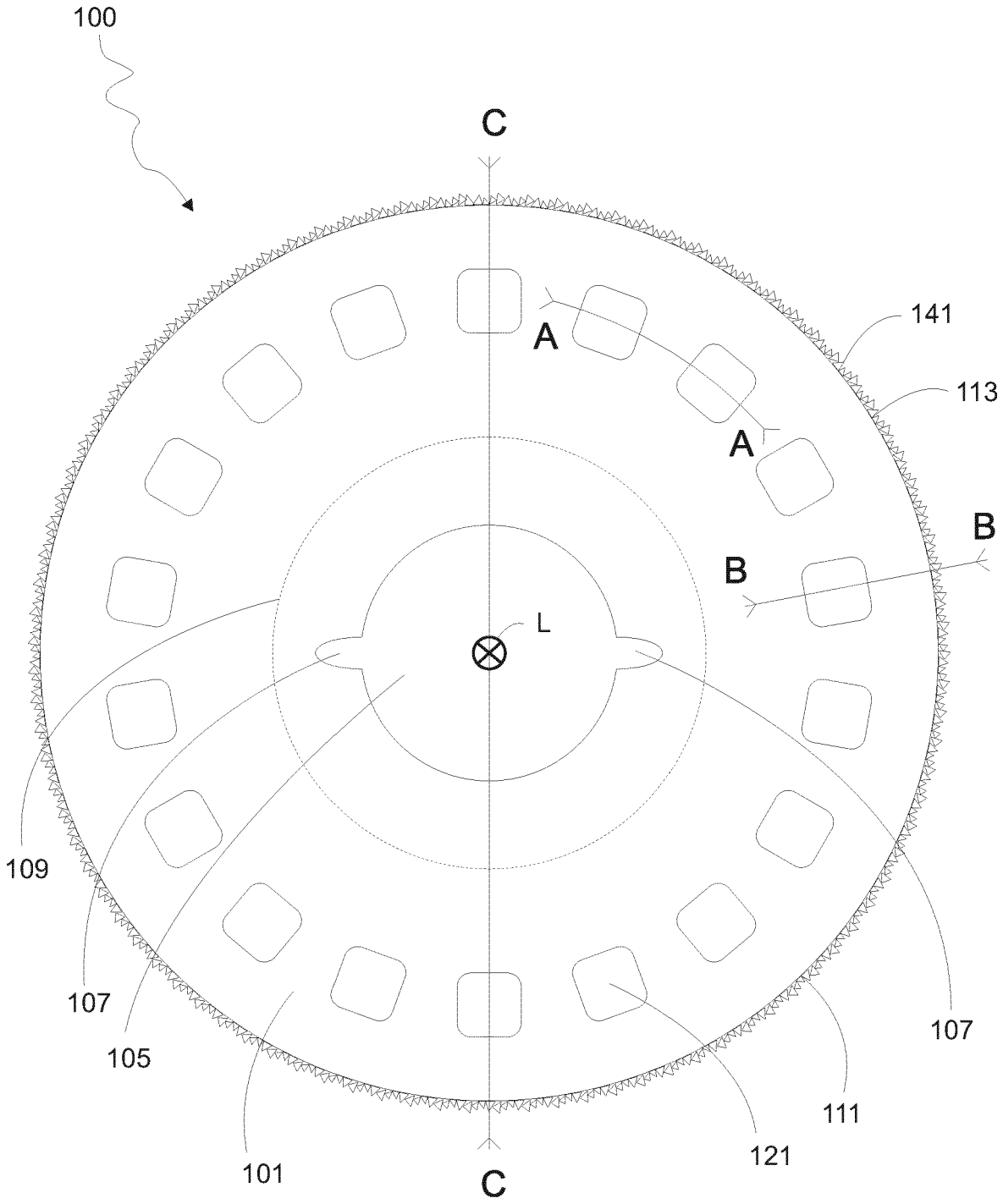

Fig. 3

Fig. 4a

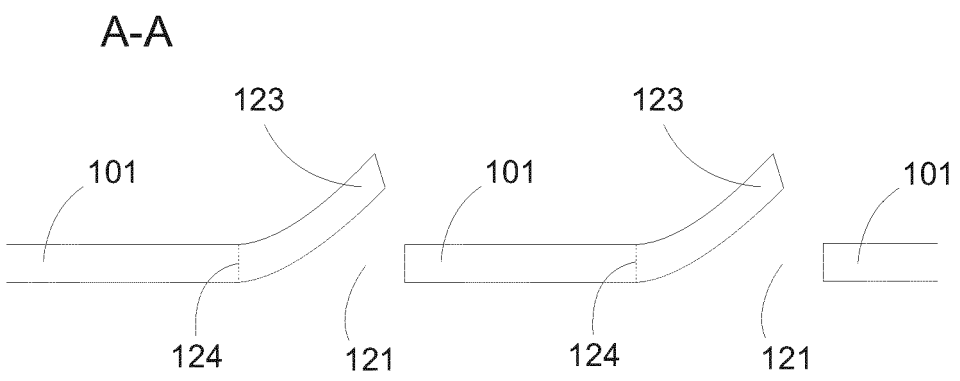

Fig. 4b

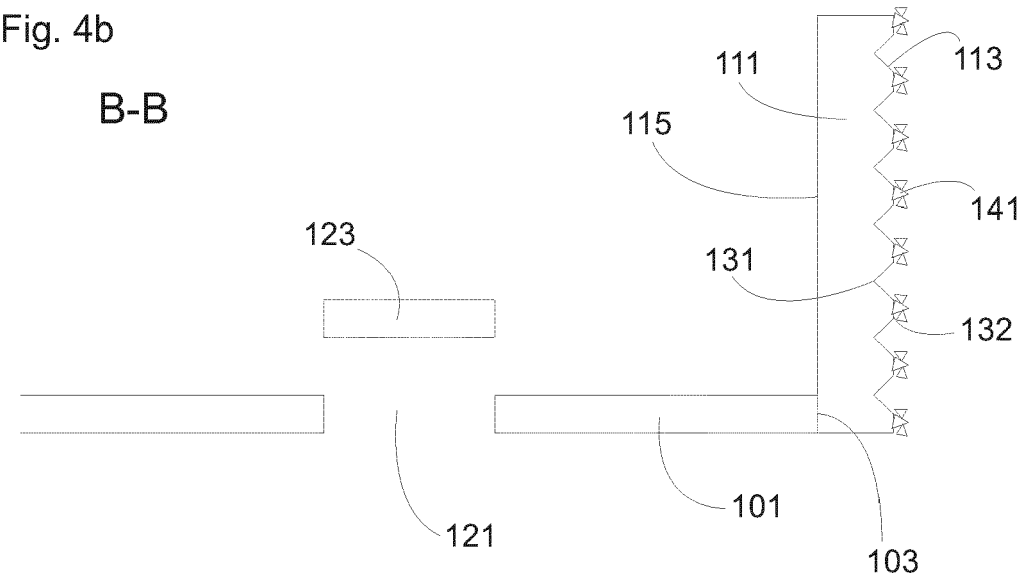

Fig. 4c

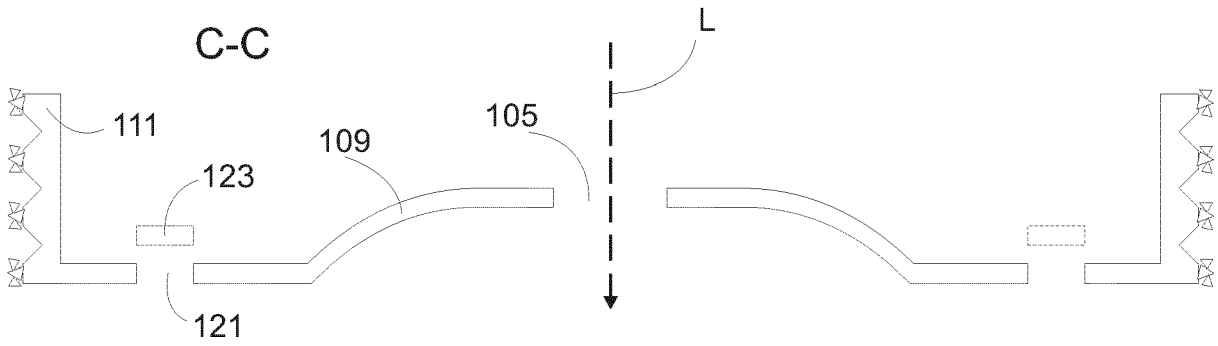

Fig. 4

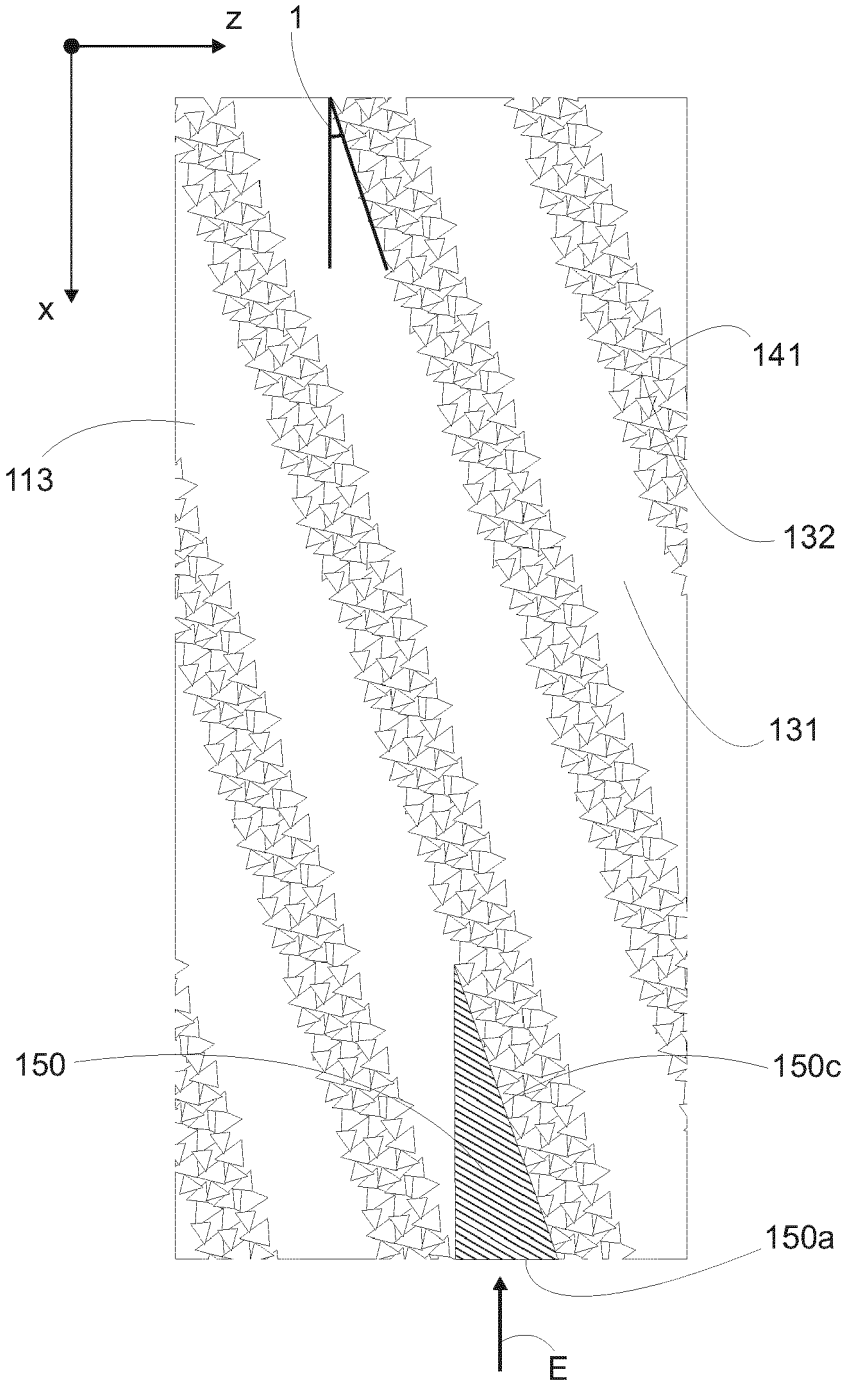

Fig. 5

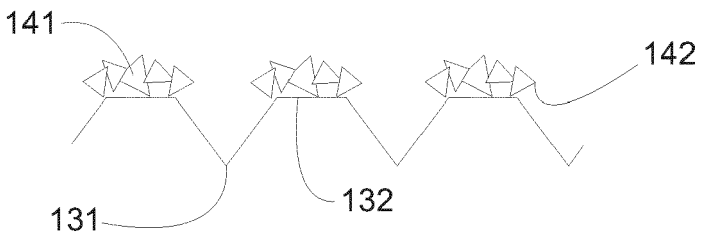

Fig. 5a

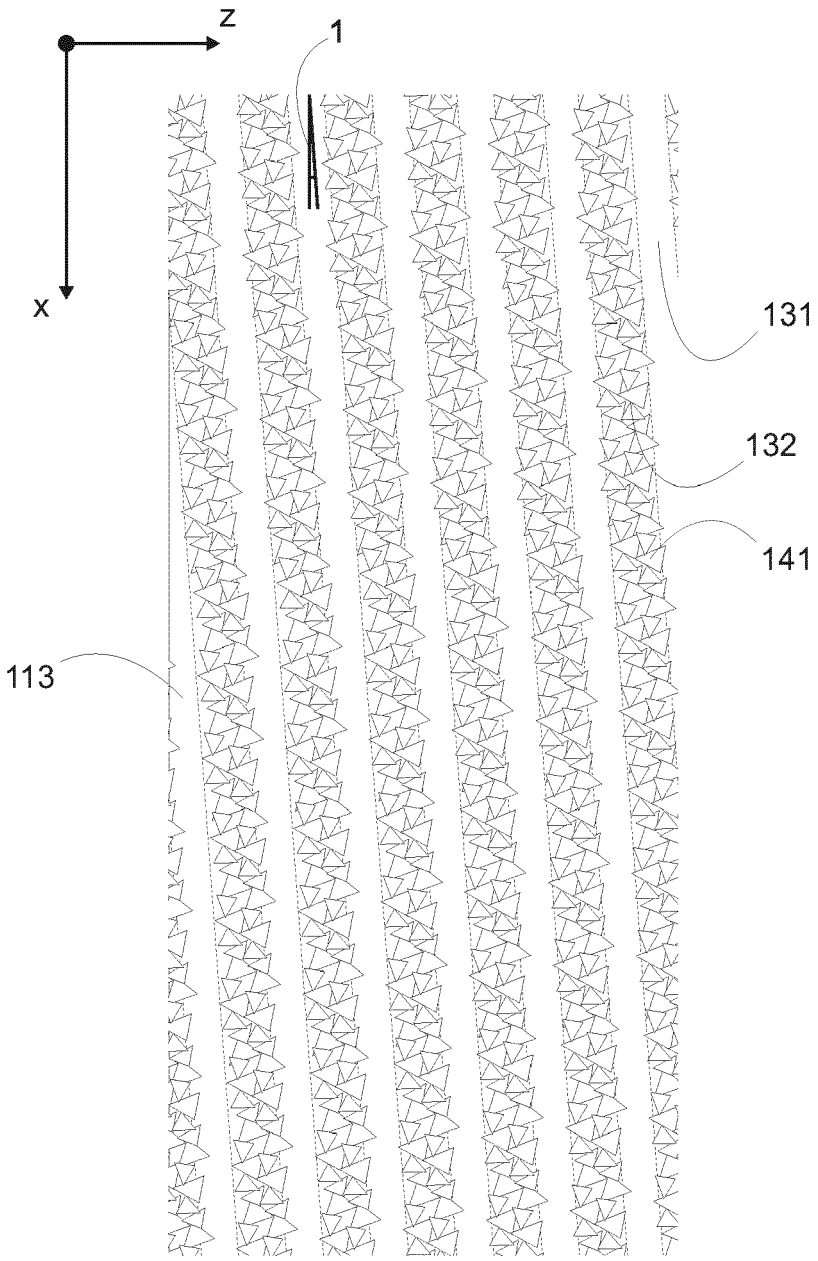

Fig. 6

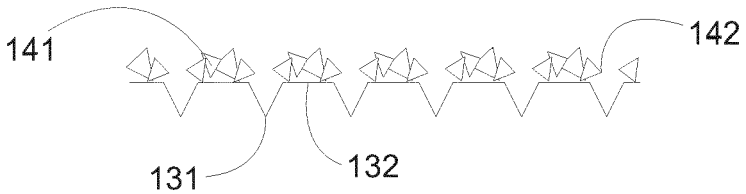

Fig. 6a

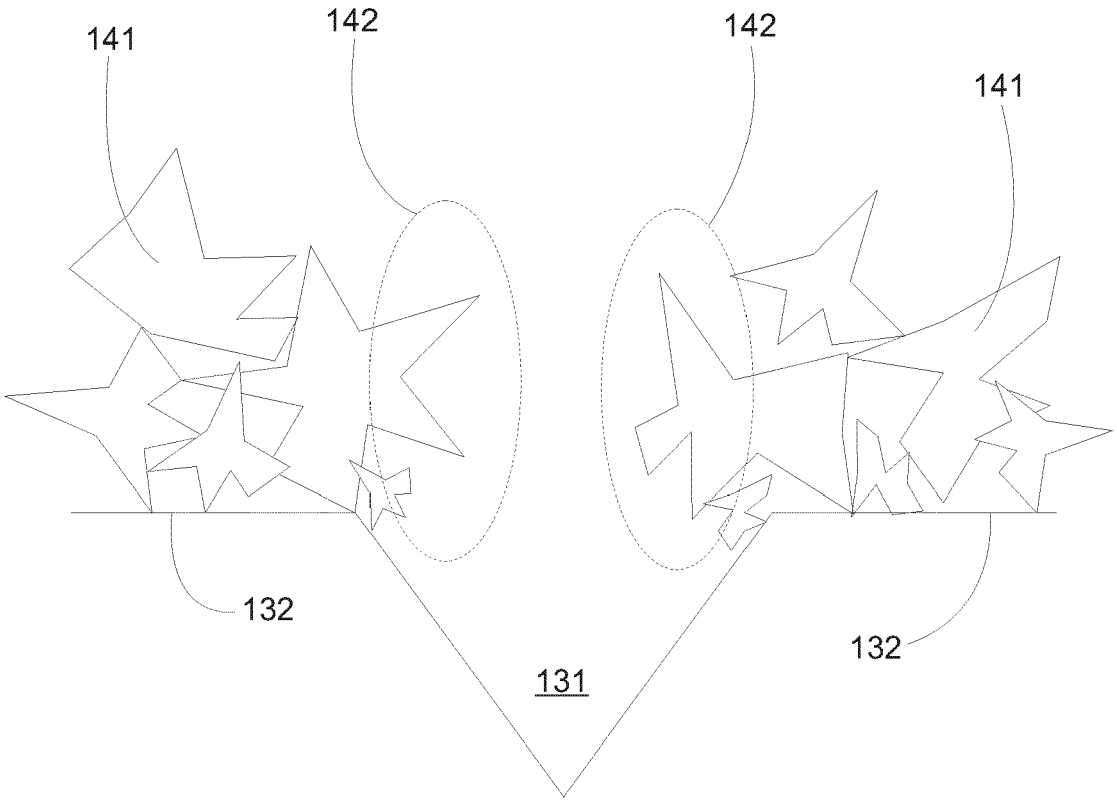

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 22 17 1607

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B28D
B23B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 September 2022	Kornmeier, Martin

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