

(19)



(11)

EP 4 491 825 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
15.01.2025 Bulletin 2025/03

(51) International Patent Classification (IPC):
E04C 5/20 (2006.01)

(21) Application number: **24187211.8**

(52) Cooperative Patent Classification (CPC):
E04C 5/203; E04C 5/20

(22) Date of filing: **08.07.2024**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(71) Applicant: **Gela Plast AB**
334 33 Anderstorp (SE)

(72) Inventors:
• **THYLÉN, Olof**
282 66 Vittsjö (SE)
• **UHLMANN, Mattias**
331 51 Värnamo (SE)

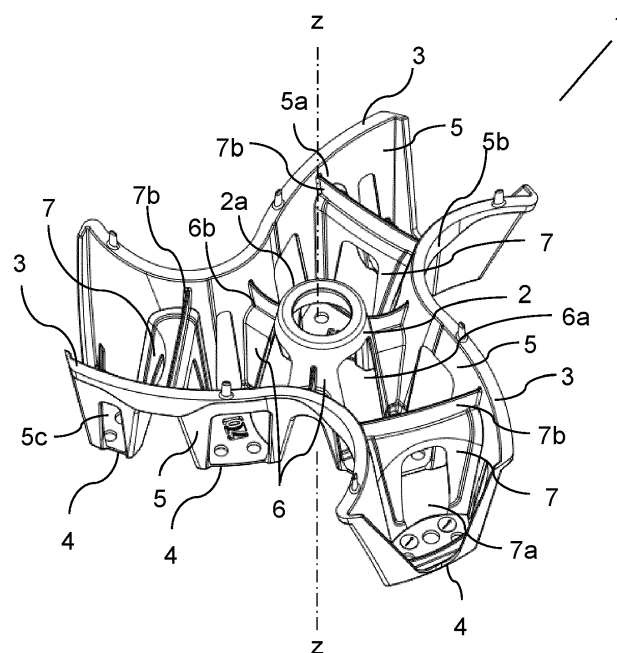
(30) Priority: **10.07.2023 SE 2350889**

(74) Representative: **Bergenstråhle & Partners AB**
P.O. Box 17704
118 93 Stockholm (SE)

(54) SUPPORT FOR A REINFORCEMENT GRID

(57) Support (1) comprising a central hub (2) around which three upper support surfaces (3) are arranged, distal from the hub (2) and distal from each other in a common first plane (A). The upper support surfaces (3) are arranged to support a reinforcement grid (30). The support (1) further comprises a plurality of lower support surfaces (4), arranged in a common second plane (B), distant from the first plane (A) and distant from each

other. These are arranged to be positioned on a ground surface (20). The support (1) further comprises a plurality of outer wall sections (5) which extends in an axial direction (Z) and connects lower support surfaces (4) with upper support surfaces (3), and the central hub (2) is connected to at least three of the plurality of outer wall sections (5) and/or at least three of the plurality of lower support surfaces (4).

**Fig. 1****EP 4 491 825 A1**

Description

Technical field

[0001] The present invention relates generally to a support arranged to support a reinforcement grid which is to be used in a concrete slab or the like.

Background art

[0002] It is well known to use different kinds of supports (spacers) to support a reinforcement grid in a concrete construction like a concrete slab, a concrete wall or the like. The reinforcement normally consists of single reinforcement bars or reinforcement grids made of steel and the most common variant for larger areas and for slabs is the reinforcement grid. To support the reinforcement grid, a plurality of supports is distributed on a ground surface (or similar) which may consist of a bedding of packed gravel, macadam, or the like. Since the surface may be a bit uneven and "soft" compared to for example if the support is to be positioned on another concrete surface, the support used for concrete slabs must have a large lower support surface in order to not sink into the ground surface. Further, an upper support surface needs to be larger than the mesh of the reinforcement grid in order not to pass through the mesh of the reinforcement grid, when the mesh rests on the upper support surface. To be cost effective and easy to produce and also easy to handle at the working site, the support normally is made of plastic, and the design is made such that the supports are stackable one in another. Further, it is known to distribute the supports manually, by use of a hand-held feeder device or by use of a semiautomatic or fully automatic feeder.

[0003] A known solution is disclosed in SE 538 843 C2, which disclose a stackable support for concrete constructions like slabs or the like, and which support is arranged for a feeding arrangement. The solution is presented in two versions, one circular and one with the shape of a "three cloverleaf". The support has an outer enclosing wall with some openings for inflow of concrete and the shape is adapted to mesh-sizes of standard reinforcement grids. The support thus may be randomly distributed on for example a ground surface without the risk of not supporting the grid due to the size and form of the support. The three cloverleafed version further provides the possibility to thread the support through the mesh of the reinforcement grid, if an extra support is needed in some position, when the grid already is positioned on top of the plurality of supports. The support is a well-functioning support but has some drawbacks. First of all, the support is quite closed in its design, due to the outer enclosing wall, where the openings could be larger or more in number, to provide a better inflow of concrete into the support. Another drawback is that the support uses a lot of material and could be smarter designed to reduce the amount of plastic material and thus reduce the carbon

print and cost for producing the support.

[0004] Thus, there is a need of an alternative support which take care of the problems of known supports for reinforcement grids.

Summary of invention

[0005] An object of the present invention is to provide a support according to claim 1, which solves the above-described problems.

[0006] According to an aspect, a support arranged to support a reinforcement grid is disclosed. The support has an extension in an axial direction and comprises a central hub arranged around a central axis extending in the axial direction. The hub may be arranged for a hand-held, semiautomatic or automatic tool for distribution of support, which is stackable into each other. The support further comprises three upper support surfaces arranged to support the reinforcement grid, wherein each upper support surface is arranged in a common first plane perpendicular to the axial direction. The upper support surfaces are arranged around the central hub, distant from the central hub and distant from one another in the common first plane, which means that support surfaces are spaced apart from each other in the common first plane but together forms a support surface which by its shape is larger than a mesh-distance of the reinforcement grid. The support further comprises a plurality of lower support surfaces arranged to be positioned on a ground surface, wherein each lower support surface is arranged in a common second plane, perpendicular to the axial direction and at a distance from the first plane. The plurality of lower support surfaces is arranged around the central axis, distant from the same and distant from one another in the common second plane. This means that the plurality of lower support surfaces is spaced apart, to save material, but together forms a larger covered area for support to the ground surface. The support further comprises a plurality of outer wall sections which extends in the axial direction, and which connects the lower support surfaces with the upper support surfaces. The central hub is connected to at least three of the plurality of outer wall sections and/or at least three of the plurality of lower support surfaces.

[0007] Such a solution save material and thereby cost and reduces the carbon print and important differences compared to known solutions, are that design with the upper and lower support surfaces and the walls connecting the same, makes the support light since less material is used (less wall surface), and concrete may enclose the interior and exterior of the support in an easy way. The latter since an easy inflow of concrete into the support is achieved as well as around the different walls on the outside, between the different lower supports and the connecting walls. The design with three (could of course be two or more) upper support surfaces which are divided into separate support surfaces instead of one continuous surface as in the presented known art, facilitates as

mentioned above, that concrete will easy flow in and around the complete structure/body of the support. This, with a "total covered area" which is larger than the free space between the steel bars of the reinforcement grid (i.e., the mesh), when "connecting" the spaced apart upper support surfaces wherein they together form an outer shape in the common first plane (where the reinforcement grid is positioned), when connecting mutually nearby lying ends of the three upper support surfaces. This means as mentioned that an area covered by the so formed outer shape is larger than a mesh in the reinforcement grid that is to be supported.

[0008] According to an embodiment, each upper support surface has an extension in the common first plane which comprises a curvature, which curvature comprises a first curve part with a first radius, which transitions into a second curve part with a second radius, wherein the first radius of the first curve part faces the hub and the second radius of the second curve part faces away from the hub. By facing the hub means that the curvature (or arc-shape) has its center, from which the radius proceeds from, on the same side of the curvature as the hub, and by facing away from the hub, means that the center and radius is in the opposite direction. Thus, the first curve part bends "inwards" towards the hub and then transitions into the next curve part "outwards" relative the hub. This design enables that the support is introducible in the mesh of the reinforcement grid, between adjacent lying bars of the reinforcement grid, but also that the design all together, with the three upper support surfaces all together, covers an area larger than the mesh-size of the grid. It is understood that the wall parts which connects the upper support parts with the lower support parts, follows the curvature of the upper support parts.

[0009] According to an embodiment, the first radius of the first curve part of the upper support surface is larger than the second radius of the second curve part of the upper support surface. Thus, the first curve part is designed as a tight bend inward, towards the hub, and which transitions into the second curve part which is a more open bend, in the opposite direction, away from the hub. This design is enabling an even more easy support to introduce through the mesh of the reinforcement grid.

[0010] According to an embodiment, the curvature of the upper support surface further comprises a third curve part with a third radius, wherein the second radius transitions into the third radius, and wherein the third radius of the third curve part faces away from the hub.

[0011] According to an embodiment, the three upper support surfaces together form an outer shape in the common first plane when connecting mutually nearby lying ends of the three upper support surfaces so that an area covered by the so formed outer shape is larger than a mesh in the reinforcement grid that is to be supported. The design may differ, but the main feature is that the spaced apart upper support surfaces together cover a wide area.

[0012] According to an embodiment, the plurality of

outer wall sections each are inclined outwards with respect to the central axis, from the lower support surfaces to the upper support surfaces. This makes the support stackable into each other wherein the supports take less space when transported and handled/distributed on the construction site and may further be used with a tool for easy distribution, where many supports may be loaded at the same time on the tool. The inclined walls further make the product stand firmly on the ground surface.

[0013] According to an embodiment, the support further comprises a plurality of first inner wall sections, wherein the hub is connected to three outer wall sections by at least one first inner wall section per outer wall section. This contributes to the strength of the product which gets robust by connecting the outer wall sections with the hub, like the spokes of a wheel.

[0014] According to an embodiment, the support further comprises a plurality of second inner wall sections which each extends between two opposite wall sections of the outer wall sections. Since the three upper support surfaces are connected to the lower support surfaces by the outer wall sections and these wall sections follows the curvature of the upper support surfaces, at least a part of one outer wall section is arranged opposite a part of another of the three outer wall sections. Due to that the plurality of inner wall sections connects two opposite outer wall sections, the support gets even more robust.

[0015] According to an embodiment, each second inner wall section extends between two opposite outer wall sections in a position along the extension of the curvature of the outer wall sections, such that the inner wall section extends from a first part of one outer wall section to a second part of an opposite outer wall section. The first part of each outer wall corresponding to a position of the first curve part of the upper support part and the second part of each outer wall section corresponding to a position of the second curve part of the upper support part. Since the first curved part of the upper support part is arranged opposite the second curved part of another of the three upper support parts, also the first part of the one outer wall section is arranged opposite the second part of another outer wall section. By that, the plurality of inner wall sections, which connects two opposite outer wall sections, contributes to strength of the support which gets even more robust.

[0016] According to an embodiment, two of the plurality of second inner wall sections connect two adjacent lower support surfaces and preferably has a common upper wall part. Two adjacent lower support surfaces are spaced apart, which means that the two second inner wall parts both connects the outer wall parts as well as connecting to an adjacent but spaced apart second inner wall part. This contributes to the open design (between the lower support surfaces) as well as the strength of the support.

[0017] According to an embodiment, the hub is arranged with a top part at the first common plane. By that, the top part act as a support to the reinforcement grid.

Optionable, the top part may be arranged a distance below the first common plane to gain better stackability of the support into each other.

[0018] According to an embodiment, the hub is connected to three lower support surfaces arranged symmetrically around the hub at the second plane by at least one first inner wall section per lower support surface. This means that the three lower support surfaces and the hub further contributes to a stiff and robust product.

[0019] According to an embodiment, each first inner wall section comprises at least one first opening. The opening in each first inner wall section allows concrete to flow into the support in an easy way.

[0020] According to an embodiment, each second inner wall section comprises at least one second opening. This contributes to easy inflow of concrete into the support.

[0021] According to an embodiment, each outer wall section comprises at least one opening. This contributes to easy inflow of concrete into the support.

[0022] According to an embodiment, the upper support surface comprises at least one protrusion, which protrudes from the upper support surface in the axial direction, in direction away from the second plane. The at least one protrusion/ upper support surface guides the supports when stacking them on top of each other to a pile and also to keep the support in position when the reinforcement grip is positioned on top of the supports.

[0023] According to an embodiment, the hub comprises a rim arranged for an automated distribution of the support by means of a distribution tool. The rim of the hub may be arranged in a number of ways to fit a distribution tool for the purpose of distributing the supports from a pile of supports carried by a handheld tool or loaded in a semiautomatic or automatic tool, in a known way.

Brief description of drawings

[0024] The invention is now described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows an isometric view of the support according to an embodiment of the invention.

Fig. 2 shows a side view of the support of Fig. 1.

Fig. 3 shows a top view of the support of Fig. 1.

Fig. 4a shows a top view of the support when positioned under a reinforcement grid which is a using position of the support.

Fig. 4b shows a side view of the support of Fig. 4a.

Description of embodiments

[0025] In the following, a detailed description of a support according to the invention is disclosed in detail in respect of embodiments and in reference to the accompanying drawings. All examples herein should be seen as part of general description and therefore possible to combine in any way in general terms.

[0026] Fig. 1 shows an isometric view of the support 1 according to an embodiment of the invention and Fig. 2 shows a side view of the support of Fig. 1. The support 1 has a propeller-like design with an extension in an axial direction Z, between a common first plane A and a common second plane B, both planes A, B have an extension perpendicular to the axial direction Z and the second plane B is distant from the first plane A. The common first plane A is a support plane where a reinforcement grid is to be positioned (see Fig. 4a-b), and the common second plane B is a plane which is to be positioned on a substrate, like a ground surface of packed gravel or the like, or another construction such as a concrete or wooden slab, i.e., the substrate on which the reinforced concrete construction is to be cast. The support 1 comprises a central hub 2, arranged around a central axis z which extends in the axial direction Z, and further three upper support surfaces 3, which are arranged to support the reinforcement grid. Thus, each upper support surface 3 is arranged in the common first plane A and the three upper support surfaces 3 are arranged symmetrically around the central hub 2 and distant from the same. Further, the upper support surfaces 3 are also arranged distant from one another in the common first plane A, such that a gap or opening is arranged at "the outer end of the propeller", so to speak, wherein the inflow of concrete inside the support 1 is facilitated. The form of the three upper support surfaces will be further discussed in relation to Fig. 3 below.

[0027] The support 1 further comprises a plurality of lower support surfaces 4 arranged to be positioned on a ground surface (see Fig. 4a-b). In the preferred embodiment there are two lower support surfaces 4 per "propeller blade" which means a total of six lower support surfaces 4. Each lower support surface 4 is arranged in the common second plane B and are arranged symmetrically around the central axis z/the hub 2, distant from the same and distant from one another in the common second plane B. Further, the support 1 comprises a plurality of outer wall sections 5 which extends in the axial direction Z and connects the lower support surfaces 4 with the upper support surfaces 3. The outer wall sections are inclined outwardly in direction from the lower support surfaces 4 to the upper support surfaces 3. The central hub 2 is connected to all three outer wall sections 5 and also to the three nearest lying lower support surfaces 4, by a plurality of first inner wall sections 6. Each first inner wall section 6 comprises at least one first opening 6a for inflow of concrete and each first inner wall section 6 further comprises one common upper wall

part 6b which splits into two first wall parts 6 which connects to one nearest lying lower support surface 4 and the hub 2, almost like a "tuning fork"-like wall.

[0028] The support 1 further comprises a plurality of second inner wall sections 7, which each extends between two opposite wall sections 5 of the outer wall sections 5. Each second inner wall section 7 comprises at least one second opening 7a for inflow of concrete and the second inner wall section 7 further comprises one common upper wall part 7b which splits into two second wall parts 7, which connect two adjacent lower support surfaces 4, such that one connects to the nearest lying lower support surface 4 close to the hub 2, and the other connects to an outermost lying lower support surface 4 (relative the hub 2), like a "tuning fork"-like wall. Each second inner wall section 7, 7b extends between the two opposite outer wall sections 5 in a position along the extension of the curvature of the outer wall sections 5, such that the inner wall section 7, 7b extends from a first part 5a of one outer wall section 5 to a second part 5b of an opposite outer wall section 5. The curvature of the outer wall sections follows the curvature of the upper support surfaces 3 and will be further discussed below in relation to Fig. 3. The central hub 2 comprises a rim 2a arranged for an automated distribution of the support 1 by means of a distribution tool. The rim 2a of the hub 2 may be arranged in a number of ways to fit a distribution tool for the purpose of distributing the supports 1 from a pile of supports 1 carried by a handheld tool or loaded in a semiautomatic or automatic tool, in a known way.

[0029] The upper support surface 3 further comprises at least one protrusion 8 per support surface, preferably two protrusions 8 per upper support surface 3. These protrusions protrude from the upper support surface 3 in the axial direction Z, in direction away from the second plane B. The protrusions 8 guides the supports 1 when stacking them on top of each other to a pile and also to keep the support 1 in position when the reinforcement grid is positioned on top of the supports 1 (see further Figs. 4a-b).

[0030] Fig. 3 shows a top view of the support of Fig. 1. It could be convenient, like in known solutions, to let the upper support surface 3 be a continuous support surface and the outer walls 5 likewise, to gain robustness of the support 1, but the design of the inventive support 1 is very robust despite the use of less material than prior art solutions and also provides better possibilities for inflow of concrete into and around the support 1. The top view of the support 1 clearly shows the "propeller-like" design with three "propeller-blades" extending from the hub 2. This design is formed by that the three upper support surfaces 3 each comprises a curvature which comprises that the upper support surfaces 3 as well as the outer walls 5, which follows the curvature of the upper support surfaces 3, have opposite an support surface 3 and an opposite outer wall 5 from another upper support surface 3 and outer wall 5. And the outer walls 5 are connected with first inner walls 6, 6b, second inner walls 7, 7b and

the hub 2 as described above, which gives the robust construction of the support 1.

[0031] Each upper support surface 3 has an extension in the common first plane A, which extension has a curvature with a first curve part 3a, which has a first radius a. This first curve part 3a transitions into a second curve part 3b which has a second radius b. The first radius a of the first curve part 3a faces the hub 2 and the second radius b of the second curve part 3b faces away from the hub 2. By facing the hub 2 means that the curvature (arc-shape) has its center point p, from which the radius proceeds from, on the same side of the curvature as the hub 2. By facing away from the hub 2, means that the center point p and radius is in the opposite direction. Thus, the first curve part 3a bends "inwards" towards the hub 2 and then transitions into the second curve part 3b "outwards" relative the hub 2. As can be seen, the first radius a of the first curve part 3a is larger than the second radius b of the second curve part 3b of the upper support surface 3. Of course, this also applies to at least upper parts of the first and second parts 5a of each outer wall section 5, which as mentioned follows the curvature of the corresponding upper support surface 3 in its extension towards the lower support surface/surfaces 4. The curvature of the upper support surface 3 further comprises a third curve part 3c with a third radius c, wherein the second radius b transitions into the third radius c. The third radius c of the third curve part 3c also faces away from the hub 2, like the second curve part 3b. The third curve part 3c may of course be a straight part as an alternative, without interfering with the inventive design.

[0032] As can be seen in Fig. 3, the support 1 may comprise a number, in this case the number 70, which indicates the height of the support 1 in millimeters. The support 1 preferably may be produced with similar design in various heights from 15-150 mm, wherein the number may be "printed"/casted in the material of the support 1.

[0033] Fig. 4a shows a top view of the support 1 when positioned under a reinforcement grid 30 which is a using position of the support 1. Fig. 4b shows a side view of the support 1 of Fig. 4a. Reinforcement grids are normally provided in a number of standard sizes concerning the diameter of individual bars 32 as well as the distance between the individual bars 32, i.e., the size of the mesh 31 of the reinforcement grid 30. The support 1 may for that reason not only be available in different heights but may also be available in a number of standard sizes, more or less scaled up/down in relation to the embodiment of the figures of this application. The design of the support 1, which is describe in detail above, with its propeller-like look with the curvature of the individual upper support surfaces 3 and outer walls 5 etc., enables that the support 1 is introducible in the mesh 31 of the reinforcement grid 30, between adjacent lying bars 32. But the design also is inventive in that the design, with the three upper support surfaces 3, all together, covers an area larger than the mesh-size 31 of the reinforcement grid 30. It is understood that the outer wall parts 5, which connects the

upper support parts 3 with the lower support parts 4, follows the curvature of the upper support parts 3. Thus, the three upper support surfaces 3 together form an outer shape in the common first plane A, when connecting mutually nearby lying ends of the three upper support surfaces 3, so that an area covered by the so formed outer shape is larger than the mesh 31 in the reinforcement grid 30 that is to be supported. This means that the supports 1 may be randomly distributed over an area without the risk of not supporting the reinforcement grid 30 in any position.

[0034] The protrusions 8 of the upper support surfaces 3 protrude from the upper support surface 3 in the axial direction Z, in direction away from the second plane B, as explained above. As further mentioned above, the protrusions 8 guides the supports 1 when stacking them on top of each other to a pile and what can be seen in Fig. 4b, the protrusions 8 also to keep the support 1 in position when the reinforcement grid 30 is positioned on top of the supports 1 since they protrudes above the height/diameter of the bars 32 of the reinforcement grid 30.

[0035] Although the description above contains a plurality of specificities, these should not be construed as limiting the scope of the concept described herein but as merely providing illustrations of some exemplifying embodiments of the described concept. It will be appreciated that the scope of the presently described concept fully encompasses other embodiments which may become obvious to those skilled in the art, and that the scope of the presently described concept is accordingly not to be limited. Reference to an element in the singular is not intended to mean "one and only one" unless explicitly so stated, but rather "one or more." All structural and functional equivalents to the elements of the above-described embodiments that are known to those of ordinary skill in the art are expressly incorporated herein and are intended to be encompassed hereby.

Claims

1. A support (1) arranged to support a reinforcement grid (30), which support (1) has an extension in an axial direction (Z), the support (1) comprises:

- a central hub (2) arranged around a central axis (z) extending in the axial direction (Z),
- three upper support surfaces (3) arranged to support the reinforcement grid (30), wherein each upper support surface (3) is arranged in a common first plane (A) perpendicular to the axial direction (Z), wherein the upper support surfaces (3) are arranged around the central hub (2) distant from the central hub (2) and distant from one another in the common first plane (A),
- a plurality of lower support surfaces (4) arranged to be positioned on a ground surface (20), wherein each lower support surface (4)

is arranged in a common second plane (B) perpendicular to the axial direction (Z) and at a distance from the first plane (A), wherein the plurality of lower support surfaces (4) are arranged around the central axis (z), distant from the same and distant from one another in the common second plane (B),

- a plurality of outer wall sections (5) which extends in the axial direction (Z) and connects the lower support surfaces (4) with the upper support surfaces (3), wherein the central hub (2) is connected to at least three of the plurality of outer wall sections (5) and/or at least three of the plurality of lower support surfaces (4).

2. Support (1) according to claim 1, wherein each upper support surface (3) has an extension in the common first plane (A) which extension comprises a curvature which comprises a first curve part (3a) with a first radius (a) which transitions into a second curve part (3b) with a second radius (b), wherein the first radius (a) of the first curve part (3a) faces the hub (2) and the second radius (b) of the second curve part (3b) faces away from the hub (2).
3. Support (1) according to claim 2, wherein the first radius (a) of the first curve part (3a) of the upper support surface (3) is larger than the second radius (b) of the second curve part (3b) of the upper support surface (3).
4. Support (1) according to claim 2 or 3, wherein the curvature of the upper support surface (3) further comprises a third curve part (3c) with a third radius (c), wherein the second radius (b) transitions into the third radius (c), and wherein the third radius (c) of the third curve part (3c) faces away from the hub (2).
5. Support (1) according to any of the preceding claims, wherein the three upper support surfaces (3) together form an outer shape in the common first plane (A) when connecting mutually nearby lying ends of the three upper support surfaces so that an area covered by the so formed outer shape is larger than a mesh (31) in the reinforcement grid (30) that is to be supported.
6. Support (1) according to any of the preceding claims, wherein the plurality of outer wall sections (5) each are inclined outwards with respect to the central axis (z), from the lower support surfaces (4) to the upper support surfaces (3).
7. Support (1) according to any of the preceding claims, wherein the support (1) further comprises a plurality of first inner wall sections (6), wherein the hub (2) is connected to three outer wall sections (5) by at least one first inner wall section (6) per outer wall section

(5).

8. Support (1) according to any of the preceding claims,
wherein the support (1) further comprises a plurality
of second inner wall sections (7, 7b) which each
extends between two opposite wall sections (5) of
the outer wall sections (5). 5

9. Support (1) according to claim 8, wherein each sec-
ond inner wall section (7, 7b) extends between two
opposite outer wall sections (5) in a position along
the extension of the curvature of the outer wall sec-
tions (5), such that the inner wall section (7) extends
from a first part (5a) of one outer wall section (5) to a
second part (5b) of an opposite outer wall section (5). 10
15

10. Support (1) according to any of the preceding claims,
wherein the hub (2) is arranged with a top part (2a) at
the first common plane (A). 20

11. Support (1) according to any of the preceding claims,
wherein the hub (2) is connected to three lower
support surfaces (4) arranged symmetrically around
the hub (2) at the second plane (B) by at least one first
inner wall section (6) per lower support surface (4). 25

12. Support (1) according to any of claims 7 - 11, wherein
each first inner wall section (6) comprises at least
one first opening (6a). 30

13. Support (1) according to any of claims 8 - 12, wherein
each second inner wall section (7) comprises at least
one second opening (7a).

14. Support (1) according to any of the preceding claims, 35
wherein each outer wall section (5) comprises at
least one opening (5c).

15. Support (1) according to any of the preceding claims,
wherein the hub (2) comprises a rim (2a) arranged for
an automated distribution of the support (1) by
means of a distribution tool. 40

45

50

55

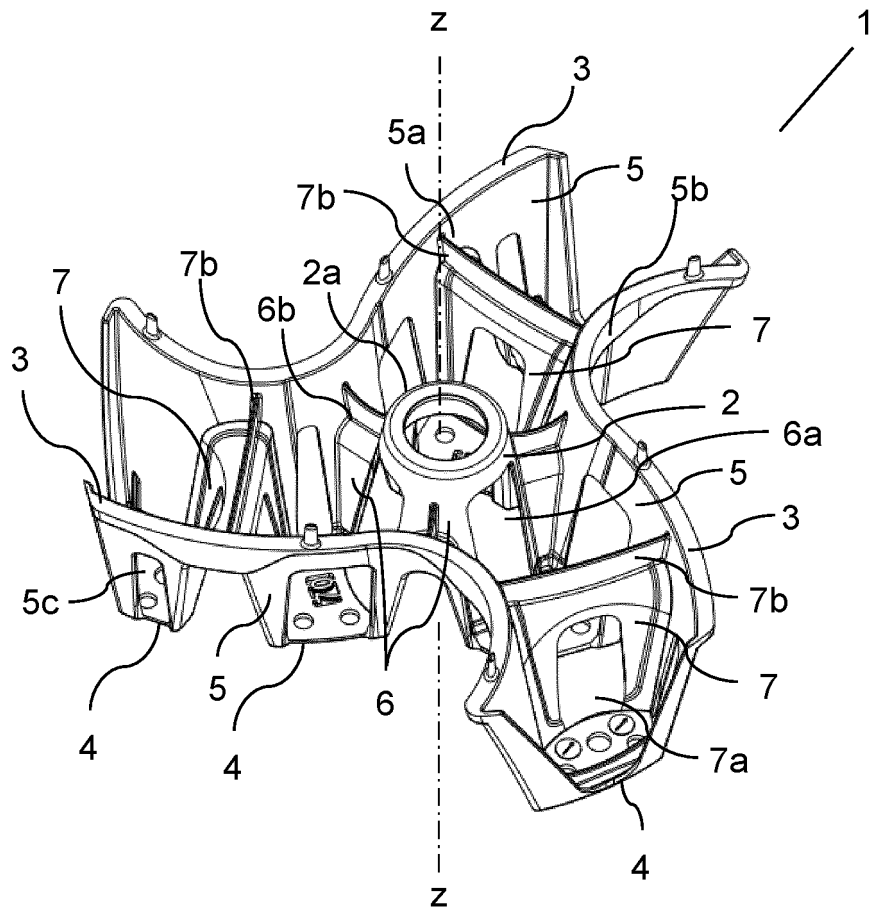


Fig. 1

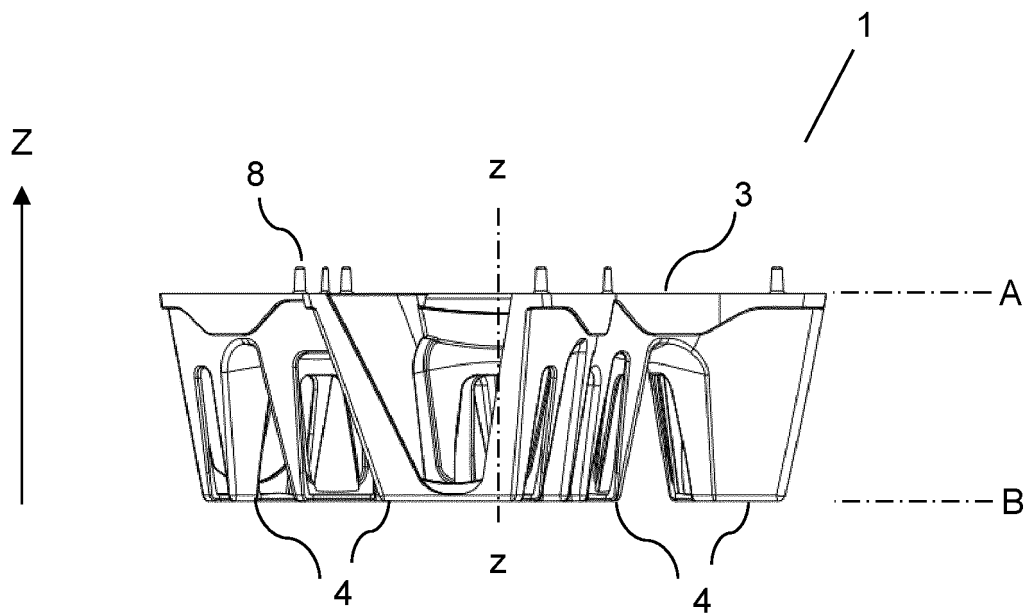


Fig. 2

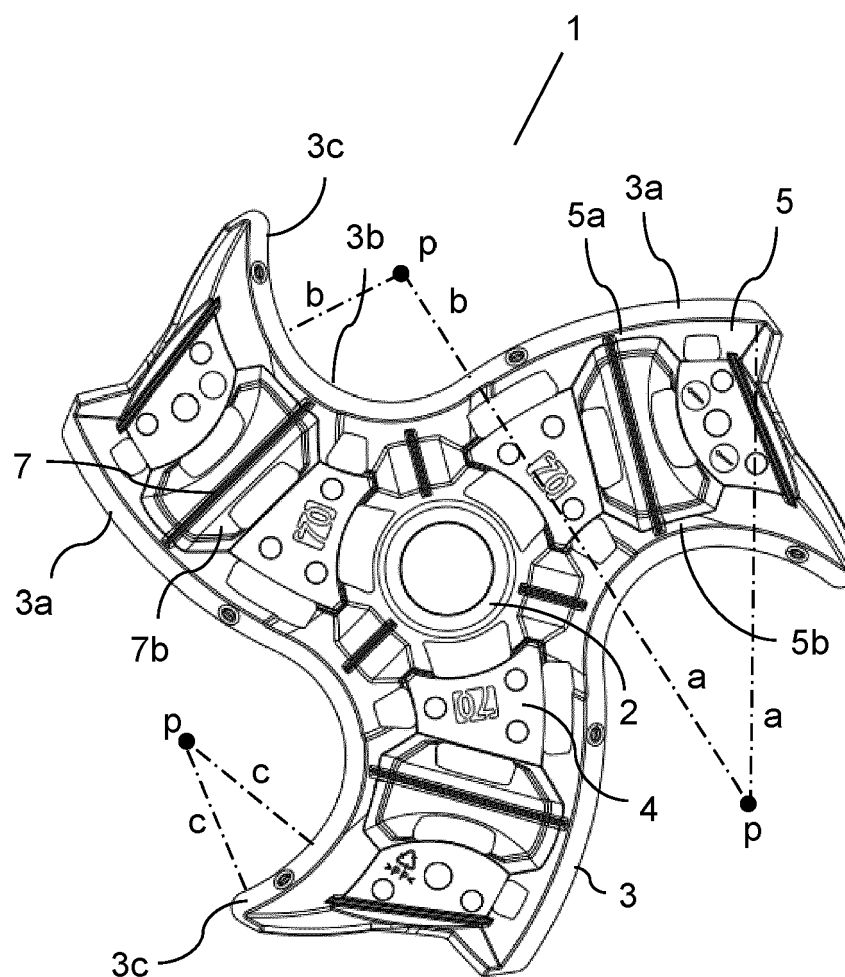


Fig. 3

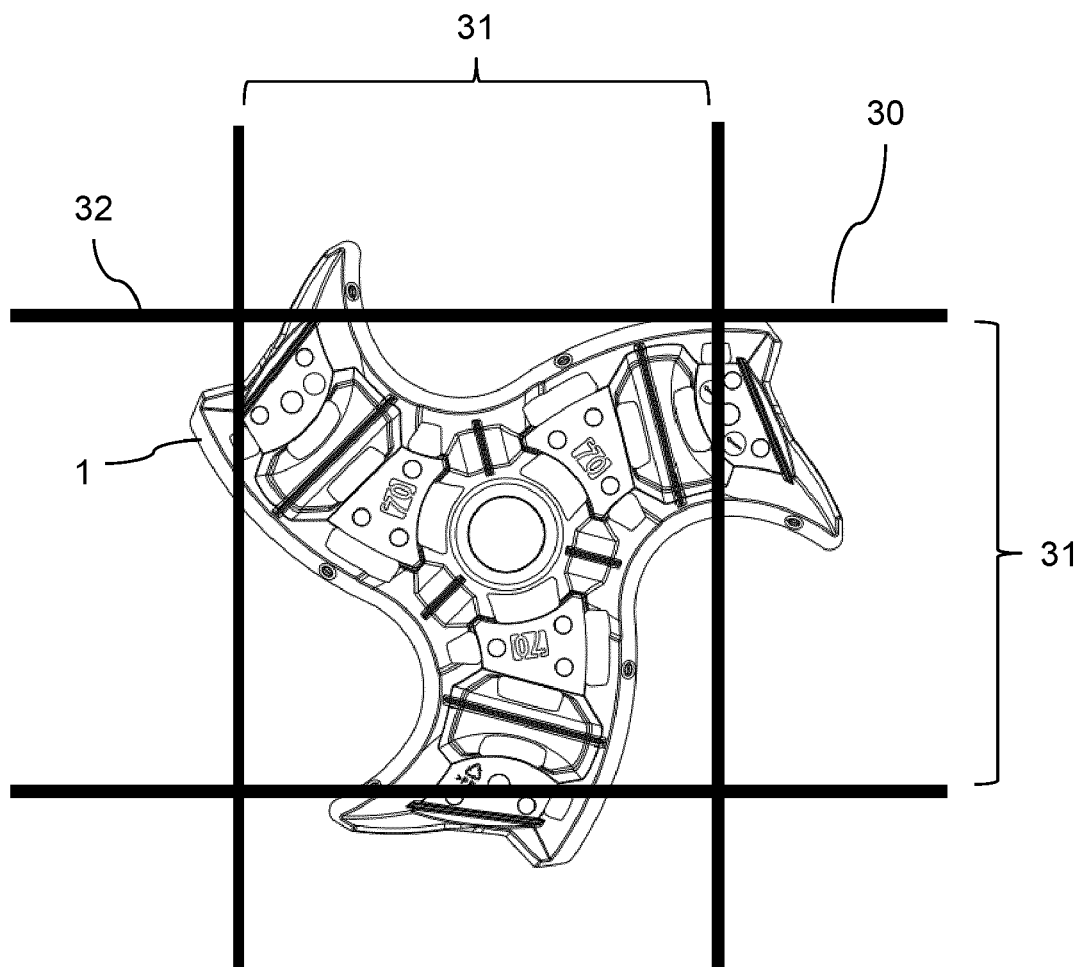


Fig. 4a

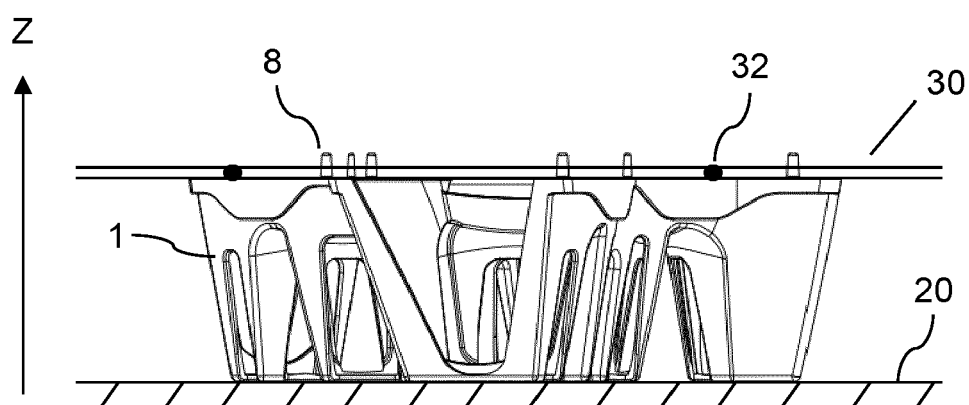


Fig. 4b



EUROPEAN SEARCH REPORT

Application Number

EP 24 18 7211

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	AU 2008 207 694 A1 (HILBERT SUPERANNUATION MAN PTY LTD [AU]) 26 March 2009 (2009-03-26) * figures 1-7 *	1-9, 11-15	INV. E04C5/20
A	-----	10	
X	CH 537 504 A (ISOFIL UND KUNSTSTOFF AG [CH]) 13 July 1973 (1973-07-13) * figures 1-3 *	1-9, 11-14	
A	-----	10,15	
X	KR 2014 0001533 A (GARAM ARCHITECTS AND ASSOCIATES CO LTD [KR]) 7 January 2014 (2014-01-07) * figures 1-10 *	1-15	

			TECHNICAL FIELDS SEARCHED (IPC)
			E04C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		5 November 2024	Petrinja, Etiet
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 24 18 7211

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05 - 11 - 2024

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
AU 2008207694	A1	26-03-2009	NONE
CH 537504	A	13-07-1973	NONE
KR 20140001533	A	07-01-2014	NONE

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- SE 538843 C2 [0003]