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(71) Applicant: **PELLY INDUSTRI AB**
330 33 Hillerstorp (SE)

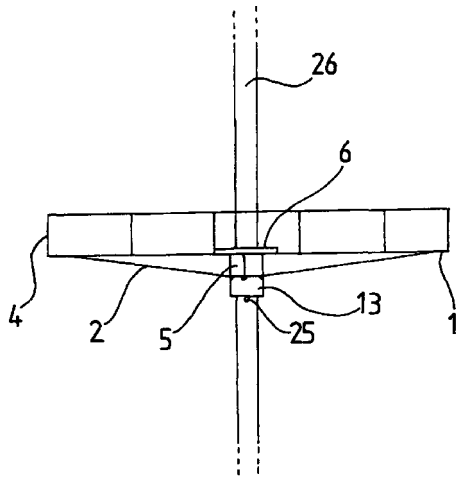
(72) Inventor: **Gustafsson, Christer**
330 33 Hillerstorp (SV)

(74) Representative:
Wallengren, Yngvar
Patentbyran Y Wallengren AB
Box 116
331 21 Värnamo (SE)

(54) Storage carousel

(57) A carousel for storage includes at least one rotary shelf (1) which is provided with a hub (5). The hub (5) connects the shelf (1) with a post (26) around which the shelf is rotary. A number of support means (2) are provided for supporting the shelf (1) in a plane which is transversely directed in relation to the post (26). The support means (2) have a transport position and a position of use. In the transport position, the support means (2) extend substantially along the shelf (1), and in the position of use, those portions which are closely adjacent the hub (5) are located a distance from the shelf (1), counting in the longitudinal direction of the post (26). The support means (2) are substantially radially disposed on the underside of the shelf (1).

Fig 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a carousel for storage and comprising at least one rotary shelf, provided with a hub, which connects the shelf to a post around which the shelf is rotary, and a number of support means for supporting the shelf in a plane which is substantially transversely directed in relation to the post.

BACKGROUND ART

[0002] Carousels for storage, often in corner cabinets, are previously known in a number of different designs. The carousels generally have a central post and one or more shelves. The shelves can either be rotary around a stationary centre post, or the centre post may also rotate together with the shelves. The shelves often consist of wire which is, for example, disposed in concentric circles or radially disposed. In order to stabilise the shelves and render them less sensitive to uneven loading, i.e. stabilise them in a plane which is normal to or at least transversely directed in relation to the post, the shelves are provided with support means. Such support means are often disposed on the underside of the shelf and they project downwards a distance from it.

[0003] The support means may, for example, consist of a number of upright sheet metal struts which are secured by welding or the like in the underside of the wires which make up the shelves. Another type of support means comprises elongate metal wires which are radially disposed on the shelf. One respective end of the metal wires is secured in the outer edge of the shelf and its other end is secured in the hub of the shelf a distance from the shelf. As a result the support means will be at angle to the shelf.

[0004] The shelf and its support means normally undergo some form of surface treatment. The methods which are employed for surface treatment are often electrolytic, such as zinc plating or chrome plating, or electrostatic, such as powder painting. In these methods, there is the risk of encountering problems on treatment of shelves displaying the above-outlined appearance.

[0005] The reason for this is that the current density is concentrated to the tips of the objects and that the coating will therefore tend to be uneven, with a thicker surface layer in outwardly directed corners, at the same time as the inside of the angles will not reliably have a sufficiently thick surface layer.

[0006] Another problem with the above-mentioned designs and constructions is that they take up a relatively large space in the vertical direction, since the support means extend axially a considerable distance outside the shelf. This entails that large quantities of packaging material are required, and that transport costs will be high since the material is bulky.

PROBLEM STRUCTURE

[0007] The object of the present invention is to realise a carousel which has such shelves that the above-outlined problems in surface treatment are obviated and that the space which is required on transport and thereby transport costs, are reduced to a minimum.

SOLUTION

[0008] The objects forming the basis of the present invention will be attained if the carousel intimated by way of introduction is characterized in that the support means have a transport position in which they extend substantially along the shelf, and a position of use in which portions of the support means closely adjacent the hub are in engagement in the hub and are located a distance from the shelf, counting in the longitudinal direction of the post.

[0009] Further advantages will be attained according to the present invention if the subject matter of the present invention is also given one or more of the characterizing features as set forth in appended subclaims 2 to 14.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0010] The present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying Drawings. In the accompanying Drawings:

Fig. 1 is a vertical side elevation of the carousel;

Fig. 2 is a plan view of the shelf included in the present invention;

Fig. 3 is a straight side elevation of the shelf according to Fig. 1;

Fig. 4 is a perspective view of a hub included in the present invention;

Fig. 5 is a perspective view of a locking unit for the hub;

Fig. 6 shows, on a larger scale, the central portion of the shelf according to Fig. 1;

Fig. 7 is an end elevation of the hub according to Fig. 4;

Fig. 8 is a perspective view of the hub mounted in the shelf; and

Fig. 9 is a perspective view of the locking unit when mounted on the hub.

DESCRIPTION OF PREFERRED EMBODIMENT

[0011] A carousel for storage of, for example, casseroles and saucepans in a corner cabinet has a vertical post 26 whose upper and lower ends are secured in the upper side and bottom, respectively, of the interior of the cabinet.

[0012] One or more rotary shelves 1 are secured to the post 26 by means of a hub 5. The shelves 1 are transversely directed in relation to the post 26 and, on use in a corner cabinet, they are substantially at fight angles to the post 26.

[0013] Each one of the shelves is in the form of a circle, possibly with a sector of the circle cut away. Fig. 2 shows a shell with approximately $^1/_4$ of the circle removed, a so-called $^3/_4$ plane. Further, the hub 5 has a cylindrical aperture 11 for accommodating the vertical post 26 around which the shelf 1 is rotary.

[0014] The shelf 1 is, in principle, constructed as a wire lattice or mesh and has a row of concentric circles 19 of metal wire and radial struts interconnecting them. Along the edge of the shelf, there extends a barrier 4 which is similarly constructed from metal wire. In the central region of the shelf 1, there is a central metal plate 20 which has a central aperture 3. The hub 5 is intended to be disposed through the central aperture 3, and the post 26 extends wholly though it. A number of support means 2 extend radially along the underside of the shelf 1. Figs. 2, 3 and 6 show the support means 2 in the so-called transport position, which is that position which the support means 2 assume on manufacture, surface treatment and transport to the end user. In this position, the support means 2 lie along the underside of the shelf 1 and, thus, substantially parallel with the shelf 1, but without being secured in it in their entirety. The support means 12 are only secured at their radially outer ends, preferably by welding.

[0015] Fig. 4 shows the hub 5 which, on assembly of the carousel, is placed in the central aperture 3. The hub 5 has an upper disk 6 which is intended to be turned to face upwards and, in its assembled position, it will abut with its underside against the central plate 20 in the central region of the shelf 1. The hub 5 has a snap anchorage for its securement in the central aperture 3. Just beneath the upper disk 6, there is a number of anchorage devices 7 being four in number in the preferred embodiment. Each one of the anchorage devices 7 has an outwardily facing ramp surface 21 which, at its lower end, is located more proximal the centre line of the hub 5 than is the case for its upper end. The upper end surfaces of the anchorage devices 7 are transversely directed, possibly at right angles, to the centre axis of the hub 5 and are located an axial distance from the underside of the disk 6 which corresponds to, or very slightly exceeds the material thickness of the central plate 20 of the shelf 1. When the hub 5 is pressed through the central aperture 3 in the shelf 1, the ramp surface 21 permits the anchorage devices 7 to be gradually pressed inwards towards the cylindrical central portion 8 of the hub in order, when assembly of the hub 5 has been completed, to spring outwards and snap the hub 5 fast in the shelf 1, the upper end surfaces of the anchorage devices 7 abutting against the plate 20.

[0016] The lower region of the hub 5 is provided with a number of axial grooves 9 distributed along the periphery of the hub; one for each one of the support means 2. The grooves 9 are substantially vertical, in the assembled position of the hub 5, and they are upwardly defined by an upper defining surface 12. The grooves 9 are disposed in the hub 5 for accommodating the support means 2, namely those ends of these support means 2 which are located approximately in the central portion of the shelf 1. In such instance, the radially inner end surfaces of the support means 2 abut against the bottoms 23 of the grooves 9. On an oblique loading of the shelf, this implies that the end surfaces of the support means will be urged against the groove bottoms 23 on that side of the shell where the oblique loading is located.

[0017] The lower region of the hub 5 has a number of locking members 10 for cooperation with a locking unit 13 which is best illustrated in Fig. 5. On the inside of the locking unit 13, there are provided a number of engagement members 15 which correspond with and are intended to cooperate with the locking members 10 so that the locking unit 13 can be positionally fixed on the hub.

[0018] The locking unit 13 is further provided with a number of accommodation spaces which correspond to the grooves 9. The support means 2 which have been accommodated in the grooves 9 are disposed to extend through the accommodation spaces 14 when the locking unit 13 is mounted on the hub 5. The accommodation spaces have lower defining surfaces 24 which, together with the upper defining surfaces 12 of the grooves 9, vertically positionally fix the radially inner ends of the support means 2.

[0019] The locking unit 13 is also provided with a centrally disposed aperture 22 through which the post 26 may extend.

[0020] Fig. 8 schematically illustrates how the struts 2 are disposed in the grooves 9 once the hub 5 has been secured in the central aperture 3.

[0021] When the inner ends of the support means 2 have finally been placed in the grooves 9, they are locked in their position against the upper defining surfaces 12 of the grooves 9. The reason for this is that the intention is to prevent the support means 2 from being accidentally displaced from their positions in the grooves 9, since such a displacement of one or more support means 2 could entail that the shelf 1 becomes warped, unbalanced so that it can no longer be rotated, or at worst that the hub 5 or the shelf 1 is subjected to

such uneven loading that they break. In order to lock the support means 2, the locking unit 13 is secured on the hub 5 once the support means 2 have been placed in the grooves 9. Once the locking unit 13 has been secured on the hub 5, it is extremely difficult to remove the locking unit 13, since the locking members 10 and the engagement members 15 in principle only permit the locking unit 13 to be moved in one direction, viz. towards the shelf 1. Only with the aid of special tools can the locking unit 13 be once again removed.

[0022] In its lower region, the locking unit 13 has a depression 18 which is radially directed and which is best visible in Fig. 9. This depression is disposed to cooperate with a pin 25 which is disposed on the post 26 of the carousel. Together, the depression 18 and the pin 25 realise a braking device which entails that the shelf 1 is braked in a certain position of rotation, which is advantageously that position which the carousel must assume for the doors of the cabinet in which it is located to be able to be closed.

[0023] For the braking device to function as intended, it is essential that the hub 5 and the locking unit 13 are positioned in a predetermined manner in the central aperture 3 in the shelf 1. For this reason, the central plate 20, which is best visible in Fig. 5, is provided with a recess 16. The hub 5 is provided with a positioning heel 17 which is best visible in Fig. 7. On assembly, the hub 5 is placed in the aperture 3 so that the positioning heel 17 cooperates with the recess 16. This achieved, the hub 5 has been correctly positioned in the shelf 1. On its upper disk 6, the hub 5 is provided with a marking or indicator, for example in the form of an arrow. The locking unit 13 is provided with a corresponding marking on its underside. When the two markings are in register, the locking unit 13 is in the correct position in relation to the hub 5. This implies that the depression 18 is also correctly positioned in relation to the hub 5 and the shelf 1.

[0024] When the shelf 1 is rotated, the above-mentioned pin in the post has a tendency to remain in the depression 18, but if a slightly greater force is employed to rotate the shelf 1, it is simple to rotate the shelf 1 to another position.

DESCRIPTION OF ALTERNATIVE EMBODIMENTS

[0025] As was mentioned above, the shelves may be entirely circular but also semicircular or $^{3}/_{4}$ circles. The central plate 20 and the hub 5 can be given an appearance which corresponds to these designs.

[0026] Further, substantially different embodiments of the support means 2 are possible. One example might be that the support means 2 are disposed radially and pivotally about respective radial axes on the underside of the shelf 1. The support means 2 may then be folded downwards in order to be substantially parallel with the shelf in the transport position, but in the position of use are folded up about the axes so that they will be substantially transversely directed in relation to the shelf 1. The groove 9 in the hub 5 may then need to be given a slightly different design, but in principle will be substantially the same as that described above.

[0027] In the foregoing, it was disclosed that the radially outer ends of the support means 2 are secured to the shelf 1 by means of welding. Other methods of securing the outer ends are snap-action with the aid of a plastic part, or hooking in the shelf 1 with the aid of a wire lug or eye.

[0028] The concentric circles of metal wire in the shelf 1 may quite simply be replaced by some other material, for example perforated sheet metal.

[0029] The shelf 1 may also be inclined in relation to the post 26 so that the plane of the shelf 1 is no longer substantially at right angle to the post 26 but makes an angle of preferably 5-20° with the post 26. Such shelves 1 are particularly common in the exposure of magazines for sale. Regardless of the inclination of the shelf 1, it may be said to be transversely directed in relation to the post 26.

[0030] The present invention may be modified further without departing from the scope of the appended Claims.

Claims

1. A carousel for storage, comprising at least one rotary shelf (1), provided with a hub (5), which connects the shelf (1) to a post around which the shelf (1) is rotary, and a number of support means (2) for supporting the shelf in a plane which is substantially transversely directed in relation to the post **characterized in that** said support means (2) have a transport position in which they extend substantially along the shelf (1), and a position of use in which portions of the support means (2) closely adjacent the hub (5) are in engagement in the hub (5) and are located a distance from the shelf (1), counting in the longitudinal direction of the post.

2. The carousel as claimed in Claim 1, **characterized in that** said support means (2) are substantially radially disposed on the underside of the shelf (1).

3. The carousel as claimed in Claim 1 or 2, **characterized in that** said support means (2) have radially outer ends which are secured in the shelf (1), for example by welding.

4. The carousel as claimed in Claim 1 or 2, **characterized in that** said support means (2) have outer ends which are pivotally connected to the shelf.

5. The carousel as claimed in any of Claims 1 to 4, **characterized in that** said support means (2), in their central ends, are disposed to cooperate with the hub (5) and to be flexed away from the shelf (1)

by said hub (5).

6. The carousel as claimed in Claim 5, **characterized in that** the hub (5) has upwardly defined, vertical grooves (9) for accommodating the inner ends of said support means (2), these ends abutting against the axially upper defining surfaces (12) of the grooves (9) in the position of use, under the action of resilient forces from the material in said support means (2).

7. The carousel as claimed in Claim 5, **characterized in that** the radially inner end surfaces of said support means (2) abut against radially inner defining surfaces in the grooves (9).

8. The carousel as claimed in any of Claims 1 to 7, **characterized in that** the hub (5) has a locking unit (13) which is disposed to lock the support means (2) in the grooves (9) in the position of use of said support means (2).

9. The carousel as claimed in Claim 1 or 2, **characterized in that** said support means (2) have radial pivot axes in the shelf (1) and that they are disposed to be pivoted towards the position of use and secured to the hub (5) in the position of use.

10. The carousel as claimed in Claim 8, **characterized in that** the locking unit (13) has, on its underside, a depressed portion (18) which, on cooperation with a pin disposed in the post is arranged to brake the shelf (1) in a position of rest in the direction of rotation.

11. The carousel as claimed in any of the preceding Claims, **characterized in that** the hub (5) is provided with positioning members (16, 17) for ensuring that the shelf (1) is given a correct position in the direction of rotation in relation to the braking pin disposed in the post.

12. The carousel as claimed in Claim 11, **characterized in that** said positioning members (16, 17) include markings on the hub and the locking unit, as well as a heel (17) which is disposed for cooperation with a recess (16) in a central aperture (3) in the shelf (1).

13. The carousel as claimed in any of the preceding Claims, **characterized in that** the shelf (1) is substantially at right angles to the post (26).

14. The carousel as claimed in any of Claims 1 to 12, **characterized in that** the shelf (1) makes an angle of 5-20° with the post.

Fig 1

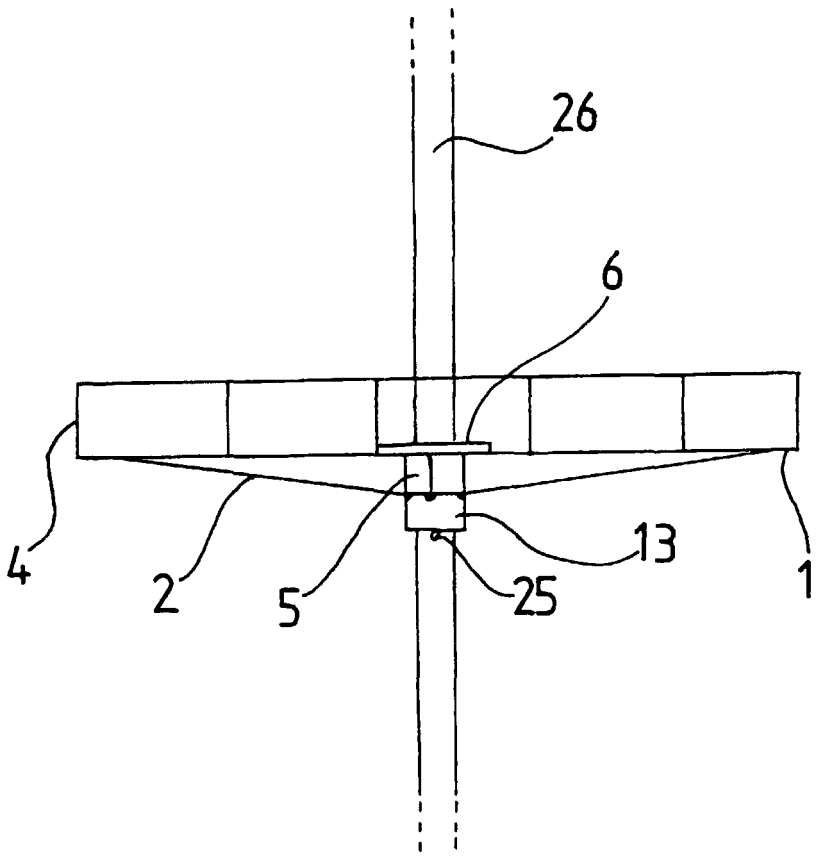


Fig 3

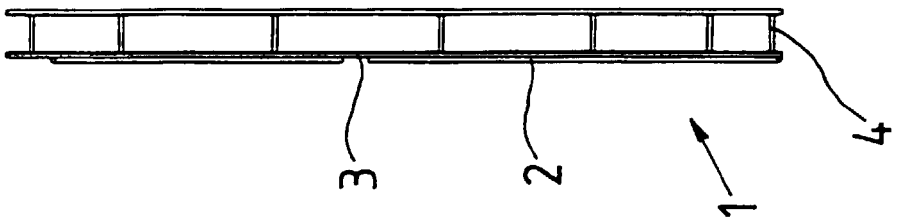


Fig 2

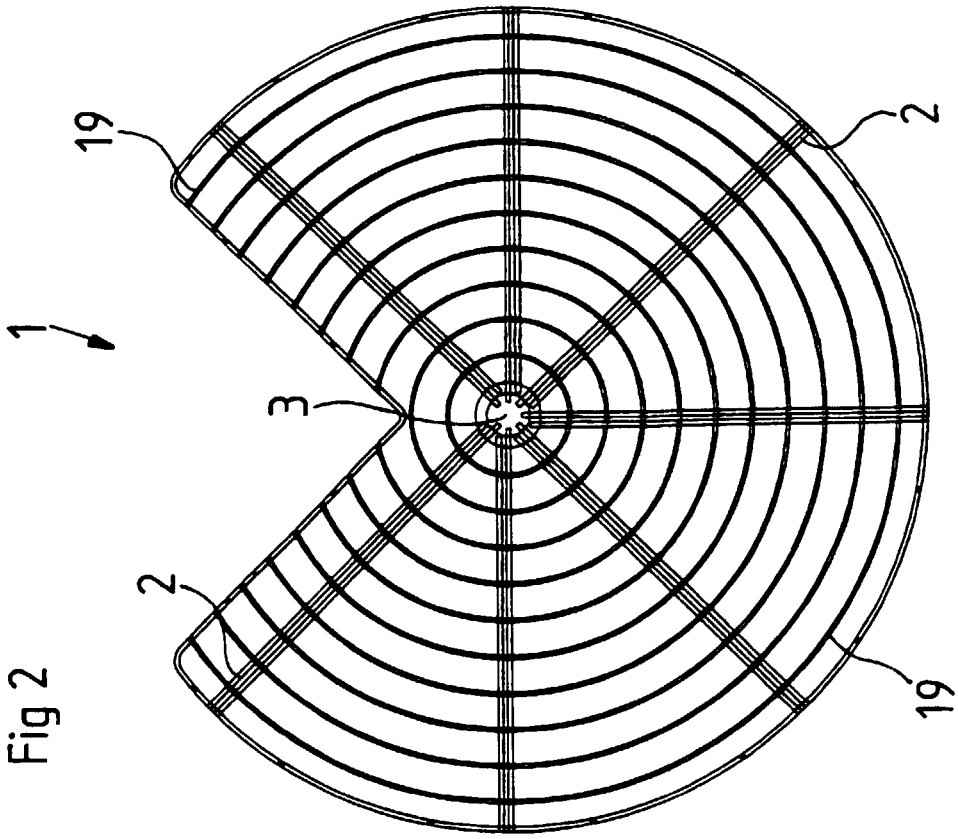


Fig 4

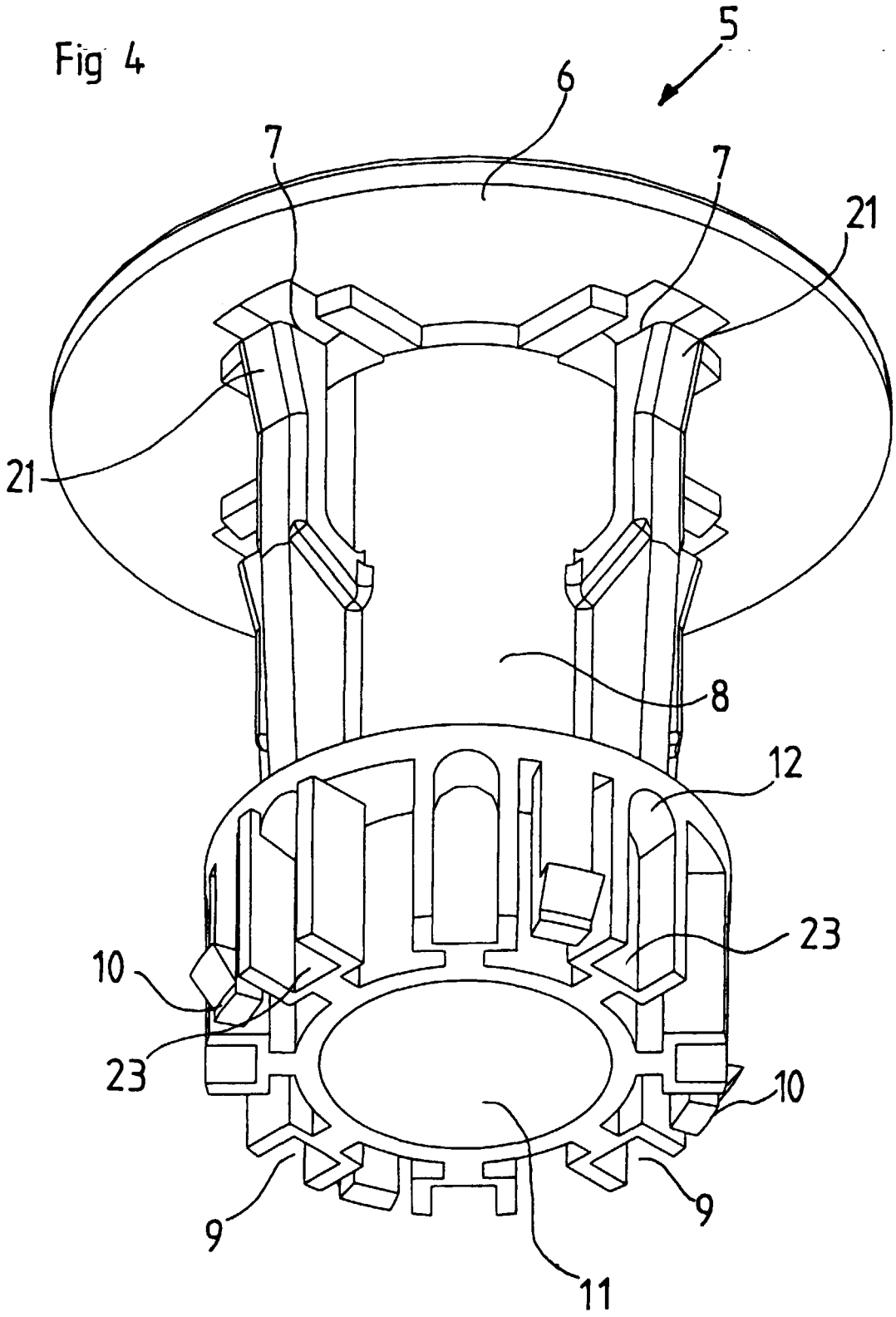


Fig 5

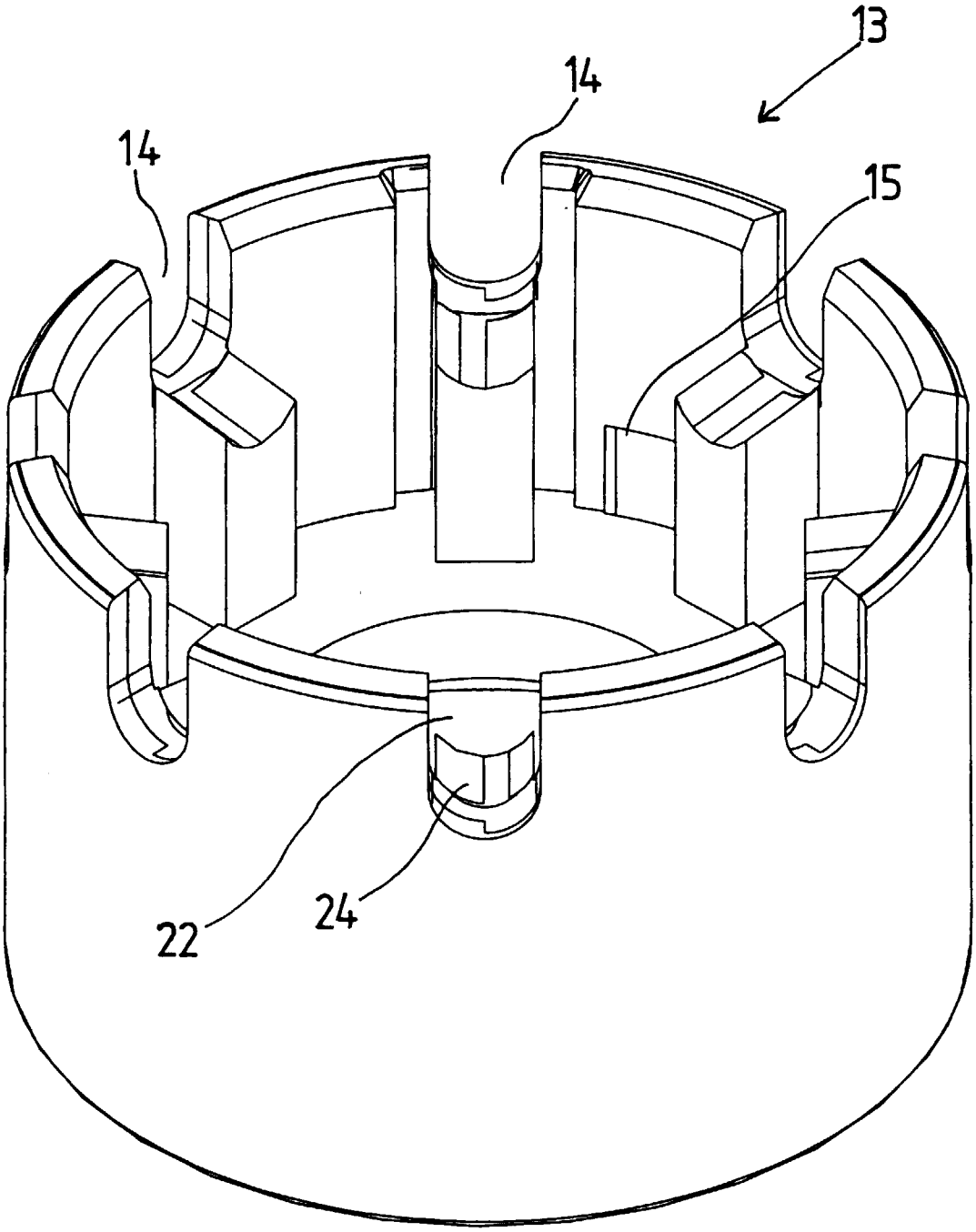


Fig 7

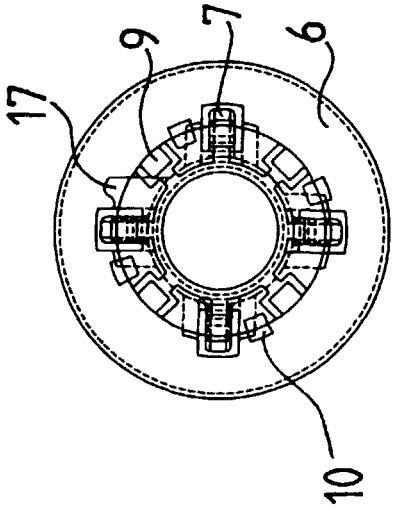
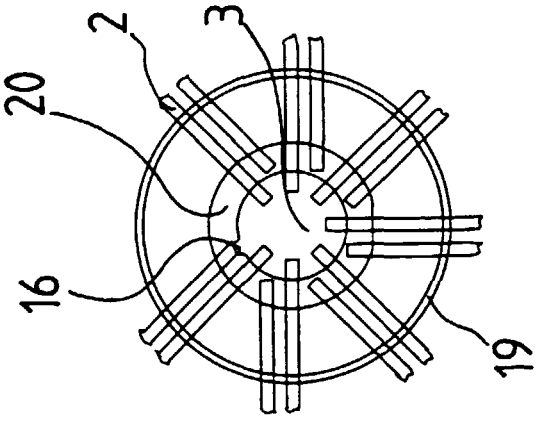


Fig 6



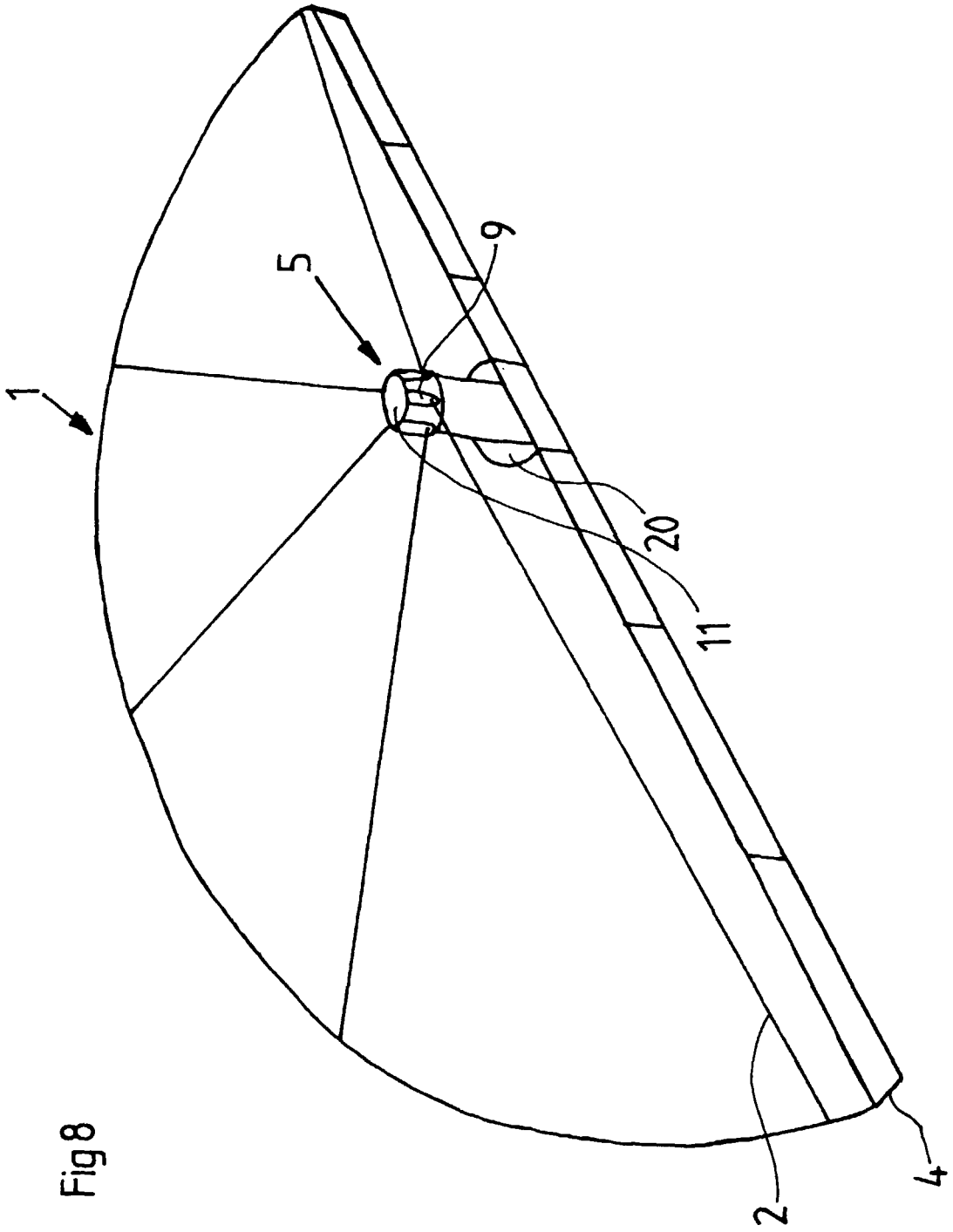
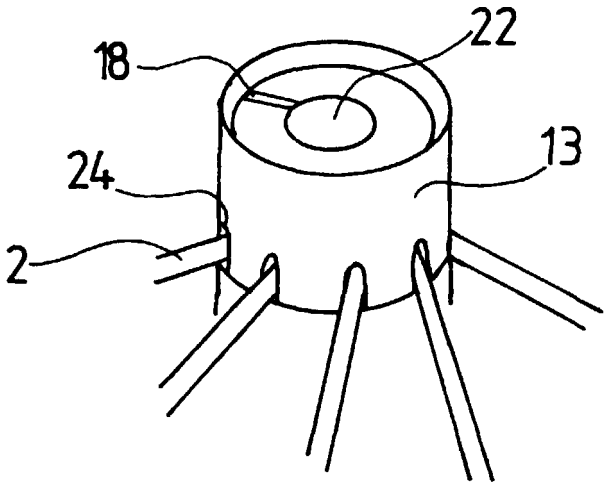


Fig 8

Fig 9



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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 0872

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 296 22 977 U (HOHENTAL) 28 August 1997 (1997-08-28) * page 4 - page 5, paragraph 1; figure 1 *	1,2,13	A47B49/00
A	US 1 908 797 A (SVALLAND) 16 May 1933 (1933-05-16) * page 2, line 2 - line 11; figures 1-4 *	1,3	
A	DE 43 00 295 A (WESTO KUNSTSTOFFTECH) 14 July 1994 (1994-07-14) * abstract; figure 1 *	1,8	
A	US 5 423 435 A (POLLARD ROSALIE M ET AL) 13 June 1995 (1995-06-13)		

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

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A47F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 June 2000	Jones, C

CATEGORY OF CITED DOCUMENTS

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26-06-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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