



- (51) **International Patent Classification:**  
*B05C 13/02* (2006.01) *A01K 87/00* (2006.01)
- (21) **International Application Number:**  
PCT/SE2012/000113
- (22) **International Filing Date:**  
19 July 2012 (19.07.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
1100560-0 22 August 2011 (22.08.2011) SE
- (72) **Inventor; and**
- (71) **Applicant : DOMEIJ, Pär** [SE/SE]; Föreningsgatan 4D, S-97436 Luleå (SE).
- (74) **Agent: JOHANSSON, Urban;** Mycklingsvägen 6, S-89430 Själevad (SE).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**  
— with international search report (Art. 21(3))

(54) **Title:** DEVICE FOR HOLDING AND CENTERING ELONGATED OBJECTS DURING ROTATIONAL SURFACE TREATMENT

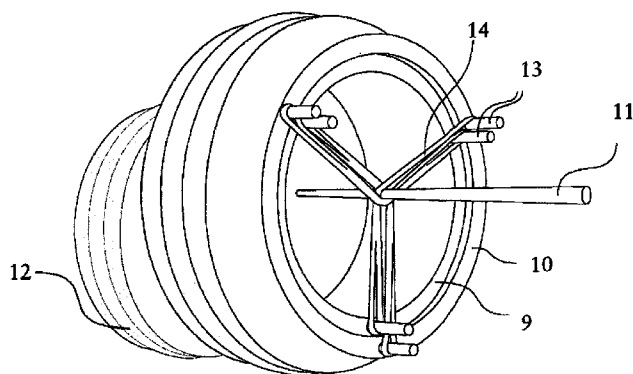


Figure 1

(57) **Abstract:** The present invention relates to a device (1), such as a chuck intended for connection to a drive unit, intended to hold elongated objects (11) such as fishing rod parts in conjunction with surface treatment. The device (1) is comprised of at least one first part (9) and at least one second part (10) which are pivotally arranged relative to one another between at least one first position where the object (11) can be inserted into the device (1) and at least one second position where the object (11) can be fixed temporarily to the device (1) with at least three tensioning devices (14). The present inventions unique feature is that the tensioning devices (14) are elongated and that each respective tensioning device (14) in one of its ends is connected to at least one fastening device in the first part (9) and that each respective tensioning device (14) in its other end is connected to at least one fastening device (13) in the second part (10) and that each respective tensioning devices' (14) distance from the device's (1) center of rotation changes during the relative turning of the first part (9) with respect to the second part (10) causing the object (11) to be held or released from the device (1) depending on the relative rotational orientation of the first part (9) and the second part (10).



## **Device for Holding and Centering Elongated Objects during Rotational Surface Treatment**

### **Field of the Invention**

The present invention concerns a device, with or without an associated drive unit, which is intended to hold (grip, secure, fix firmly) and center elongated objects during rotational surface treatment in accordance with the claims.

### **Background of the Invention**

In several instances, there is a need to retain (grip, hold, secure) and center an object in an apparatus which is intended to cause the object to rotate. An example of this is various chucks or other holding devices which are intended to securely hold objects as they rotate. Chucks are found in a very large number of variants, for example, variants of the chucks are used to hold the elongated parts of fishing rods in conjunction with surface treatment (finishing) or other working processes. For example, during surface treatment of high-quality fishing rod parts, such as painting, coating and sealing, the rod parts usually need to rotate several hours if a satisfactory result is to be achieved. If the rod part loosens before the paint (lacquer, sealant) dries, it is usually more work to renovate the rod than to make a new rod part. It is especially difficult to attach a rod tip to a rotating device. The difficulty lies in that rod part sizes typically vary greatly, such as a rod tip having a diameter of 1.2 mm, to the handle part of the rod having a diameter of for example 28 mm or more.

One problem with temporarily attaching an object to a chuck or the like is that the clamping action of the chuck often results in damage or the like on the clamped object. This is particularly problematic in surface treatment of, for example, fishing rods and the like where the material's surface is easily damaged.

Another problem when attaching elongated objects to a chuck or the like is that the bearing frame of the object's other end needs to be closely aligned with the chuck's center of rotation.

Yet another problem with existing designs of chucks is that they for example can not securely hold a rod tip if it is inserted with its top guide (ring, eye) in the chuck. Even in other situations it is desirable to securely grip an elongated object having any type of attachment such as a ring, a hook, a knob, a catch, a handle or the like on one or both of its ends.

A further problem with existing designs of chucks is that they do not in an efficient manner provide a way, in the same chuck without adjustments or replacement of parts, of securing or holding objects regardless of the objects' cross sectional shapes. Objects with polygonal or asymmetrical cross sectional shapes are usually problematic to manage in a satisfactory manner so that these objects are held firmly (securely).

There is a clear need of a chuck that can hold firm elongated objects of different sizes (dimensions) and forms (shapes) in a gentle non-damaging manner.

### **Prior Art**

Chucks intended to be used when surface treating elongated objects, for example fishing rod parts have been well-known for some time. For example, the company Pacific Bay International has produced a variant of a device for holding a rod part in conjunction with surface finishing (treatment). The design includes a simplified variant of a lathe chuck. The design differs greatly from the present invention's design.

Designs intended for use during finishing and the like of hollow rod parts are previously known. For example, JP2004283702 describes a variant of a device for use in surface treatment of tubular rods. Fixation of pipe/rods occurs by way of a conical centering device which is inserted into the rod's ends. The design differs to a substantial degree compared with the design of the present patent application. For example, the rod part is not held loosely in a holder (chuck) by elastic members. The design according to its description can not be used on non-tubular objects. Further, the cone included in the design can only grasp (hold) objects within a limited range of size.

JP1148138 describes a variant of a device for use in winding line and the like on fishing rods. The design in accordance with its description differs to a substantial degree from the design in accordance with the present patent application. For example, rod parts are not held loosely in a holder (chuck) by elastic members.

JP2002171867 describes a variant of a device for winding film or the like on fishing rods. The design in accordance with its description differs to substantial degree from the design in accordance with the present patent application. For example, rod parts are not held loosely in the device's holder (chuck) with elastic members.

### **Brief Description of the Invention Concept**

The main purpose of the present invention is to create a substantially improved chuck, intended for securely holding elongated objects such as fishing rod parts or the like and also causing these worked pieces to rotate. Another purpose of the present invention is to create a  
5 chuck that can temporarily hold objects such as fishing rods parts without their surfaces being damaged. A further purpose of the present invention is to create a chuck that can be attached to and detached from elongated objects by hand without regard to the objects' cross sectional shape. A yet further purpose of the present invention is to create a chuck that is cost effective to manufacture and operate.

### **10 Brief Description of the Drawings**

In the following detailed description of the present invention, reference and references to the following figures will occur. Each figure is briefly described in the following figure list. The exemplifying embodiments in the figures are not limiting for the scope of protection of the present patent application. Note that the figures are schematic and details may thus be omitted  
15 in these.

Fig. 1 shows a preferred embodiment of the present invention in perspective from a front angle.

Fig. 2 shows the preferred embodiment of the invention from the front with the elastic members in an open position where an object can be inserted between the elastic members.

20 Fig. 3 shows the preferred embodiment of the invention from the front with the elastic members in a halfway closed position.

Fig. 4 shows the preferred embodiment of the invention from the front with the elastic members in a closed position where an object is held by the elastic members.

Fig. 5 shows the preferred embodiment of the invention from the side.

25 Fig. 6 shows the preferred invention in a cross sectional side view. The figure also shows, in its upper part, a suggestion for a simple lock using a ball and an O-ring.

Fig. 7 shows a cross sectional view of a first part, the hub.

Fig. 8 shows a cross sectional view of a second part, the housing.

## Detailed Description of the Invention

With reference to the figures, a device 1 is shown in accordance with the present invention with which at least one object 11 is intended to temporarily be held and centered during rotational surface treatment. The device according to the embodiment shown in the figures is a variant of a chuck. Preferably the object 11 consists of an object 11 with an elongated shape. The device 1 in the shown figures is connected to a drive (motor) unit 12 which causes the chuck to rotate. Preferably, the device 1 is connected to an outgoing shaft (not shown in the figures) or the like, in the drive unit 12. The type of drive unit 12 that causes the device 1 to rotate may vary greatly within the scope of the present patent application. The drive unit may preferably be electrically operated, but even other types of previously known drive units are conceivable.

The chuck 1 is comprised of at least one first part 9 and at least a second part 10 which are pivotally connected to each other around a common axis of rotation which in the preferred embodiment essentially coincides with the chuck's axis of rotation. The first part 9, in the exemplifying embodiment is comprised of a hub part 9 which is connected to drive unit's 12 outgoing axle (shaft) or the like. The hub 9, in the preferred embodiment is preferably bowl-shaped. The second part 10 consists of a housing 10 or the like which is intended to be connected to the hub part 9. The hub part 9 and the housing 10 are intended to be temporarily fixed to each other at a specific rotational position by at least one locking device. In the exemplifying embodiment, the locking device consists of at least one groove, at least one ball and at least one O-ring.

The first part (hub part) 9 is comprised, in its front portion, the front edge, of at least two fastening devices 13 and preferably three fastening devices 13. In the preferred embodiment, the fastening devices 13 consist of pegs (pins). In the preferred embodiment, the hub part includes three pegs 13. Preferably, the pegs 13 are placed equidistantly, that is to say at 120 degrees from each other. A different number and another for the purpose suitable placement of the pegs (pins) 13 may exist within the scope of the present invention.

The second part (housing) 10 is comprised, in its front portion, the front edge, of at least two other fastening devices 13 and preferably three fastening devices 13. In the preferred embodiment, the fastening devices 11 consist of pegs (pins). In the preferred embodiment the housing includes three pegs 13. Preferably, the pegs 13 placed equidistantly, that is to say at

120 degrees from each other. A different number of pegs (pins) and another for the purpose suitable placement of the pegs 13 may exist within the scope of the present invention.

Preferably, the number of pegs (pins) 13 in the first part 9 and the number of pegs 13 in the second part are the same.

5 Unique to the preferred embodiment of the present invention is that the object 11 to be held securely by the chuck 1, is connected (secured) to the chuck 1 by tensioning devices 14, attaching devices or the like. The tensioning devices 14 are preferably elongated in shape. Each tensioning device 14 has one end connected to at least one fastening device (pin) 13 in the first part 9. Further, each tensioning devices' 14, other end is connected to at least one  
10 fastening device (pin) 13 in the second part 10. The number of tensioning devices 14 are preferably as many as the number of pins 13 in the hub part 9, or alternatively, as many as the number of pins 13 in the housing 10. An excellent centering and holding effect was found to be achieved if the number of tensioning devices 14 used is three. In alternative embodiments, the number of tensioning devices, however, may be more than three in number. In the figures  
15 shown in the preferred embodiment, the tensioning devices (attachment, holding devices) 14 consist of elastic and resilient members such as any type of elastic band such as preferably rubber bands 14 or similar.

In alternative embodiments, it is conceivable that the tensioning device 14 be comprised of an essentially rigid and inelastic material such as material made of metal or the like.

20 The first part, the hub part 9, and the second part, the housing part 10, are mutually pivotally arranged relative to each other around a common fulcrum (the chuck's axial center of rotation) between a first position (shown in Fig. 2), where an object 11 may be inserted into the bowl-shaped hub part 9 of the chuck 1 and a second position (shown in Fig. 4) where the object 11 is temporarily fixed (connected) to the chuck 1. The mutual pivotal ability between  
25 the hub part 9 and the housing 10 may vary within the scope of the present patent application. The pivotal action (rotational angle) between the first part 9 and the second part 10 is determined by the number of tensioning devices and the number of fastening devices.

When using the chuck 1 in accordance with the present patent application, the chuck 1 is connected to a drive unit 12. If the chuck 1 is not in an open position that is to say in a closed  
30 position 4, where an object 11 can not be inserted in the chuck (between the tensioning devices), the first part, the hub, and the second part, the housing, are mutually turned (rotated)

until an open position 2 is achieved where object may be inserted into the chuck (between the tensioning devices). In Fig. 2 and 3, the chuck is in an open position, in which the object may be inserted between the elastic members 14, elastic bands. In Fig. 1 and 4 the chuck is in a closed position in which objects may not be inserted between the elastic members. After an object 11 has been inserted between the tensioning devices such as rubber bands 14, the hub 9 and the housing 10 are mutually turned (rotated) so that the distance between the tensioning devices (rubber bands) and the center of rotation decreases. By this turning the object will be positioned (held) by the tensioning devices (rubber bands). This chucking (tensioning, holding) is however accomplished in a mild and gentle manner which does not damage the object (such as fishing rod part).

This flexible chucking (tensioning, holding) further allows the bearing support in the elongated object's far end to differ significantly with respect to the chuck's rotational center.

The flexible tensioning devices' elasticity further allows objects of differing cross sectional shapes to be held securely by the chuck.

In the detailed description of the present invention, design details and certain procedures may have been omitted which are apparent to persons skilled in the art of the field that encompasses the present method and device. Such obvious design details and methods are included to the extent necessary so that the proper and full performance of the present method and device is achieved.

Even if certain preferred embodiments have been described in detail, variations and modifications within the scope of the invention may become apparent for specialists in the field that encompasses the invention. All such modifications and variations are regarded as falling within the scope of the following claims.

### **Advantages of the Invention**

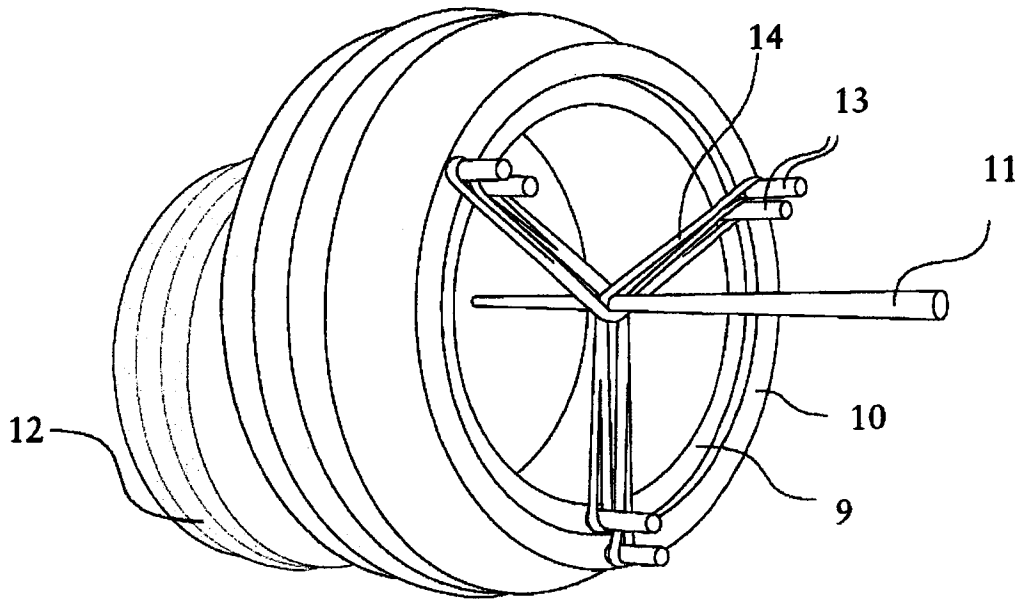
The present invention achieves several advantages. The most obvious is that a more effective device for holding elongated objects such as fishing rod parts, which are preferably going to be rotated, is achieved. Another advantage of the present invention is that it can hold elongate objects with delicate surfaces, in a very gentle manner without damaging the surface. A further advantage of the present invention is that it can hold on to elongate objects with essentially all types of cross sectional shapes, even completely asymmetrical shapes within a certain range of dimensions with one and the same chuck. A yet further advantage of the

present chuck is that it is self-centering. It is a further advantage that the chuck can be opened and closed and also locked if it is provided with a suitable locking mechanism, by one hand. Further, it is advantageous that the present chuck allows elongated objects to rotate at an angle relative to the chuck's rotational center. It is also an advantage of the present invention that elongate objects having any form of attachment hardware such as a guide, an eye, a hook, a knob, a catch, a handle (grip) or the like on its one end can still be held by the chuck. A still further advantage of the present chuck is that it has few moving parts which makes it effective to both manufacture and use.

## Claims

1. Device (1), such as a chuck intended for connection to a drive unit, intended to hold elongated objects (11) in conjunction with rotating surface treatment, said device (1) being comprised of at least one first part (9) and at least one second part (10) which are pivotally arranged relative to one another between at least one first position where the object (11) can be inserted into the device (1) and at least one second position where the object (11) can be fixed temporarily to the device (1) with at least three tensioning devices (14) **characterized by** that the tensioning devices (14) are elongated and that each respective tensioning device (14) in one of its ends is connected to at least one fastening device in the first part (9) and that each respective tensioning device (14) in its other end is connected to at least one fastening device (13) in the second part (10) and that each respective tensioning devices' (14) distance from the device's (1) center of rotation changes during the relative turning of the first part (9) with respect to the second part (10) causing the object (11) to be held or released from the device (1) depending on the relative rotational orientation of the first part (9) and the second part (10).
2. Device (1) according to claim 1 **characterized by** that the first part (9) in its front portion includes at least three fastening devices (13) in the form of pegs which are essentially placed equidistantly from one another and that the second part (10) in its front edge includes at least three fastening devices (13) in the form of pegs (13) which are essentially placed equidistantly from one another.
3. Device (1) according to at least one of the previous claims **characterized by** that the chuck includes at least one locking device with which the first part and the second part can temporarily be locked to one another in the axial direction.
4. Device (1) according to claim 3 **characterized by** that the locking device includes at least one groove, at least one ball and at least one ring of elastic material such as an O-ring.
5. Device (1) according to at least one of the previous claims **characterized by** that the tensioning device (14) is comprised of an elastic material.
6. Device (1) according to at least one of the previous claims **characterized by** that the tensioning device (14) is made of rubber bands.

7. Device (1) according to at least one of the previous claims **characterized by** that the number of tensioning devices (14) amounts to three.
8. Use of the device (1) according to one or more of the previous claims for surface treatment of elongated objects.
9. Use of the device (1) according to claims 1 to 7 for surface treatment such as painting, coating, sealing or similar of fishing rod parts.



Figur 1

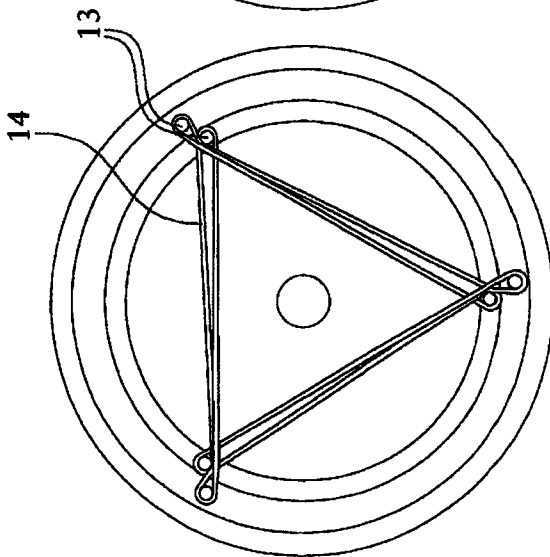


Figure 2

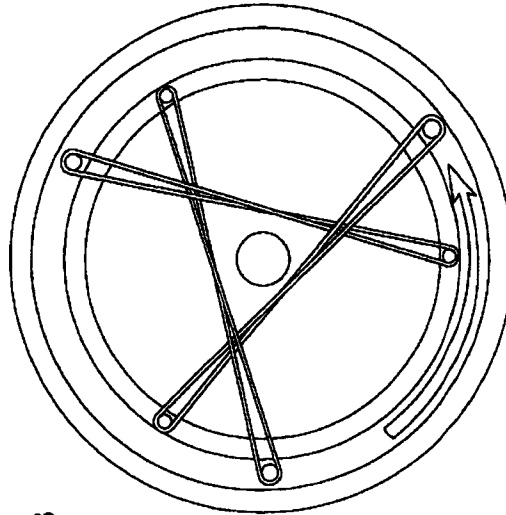


Figure 3

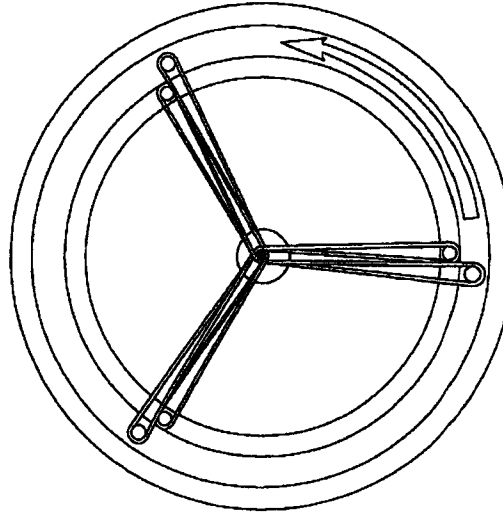


Figure 4

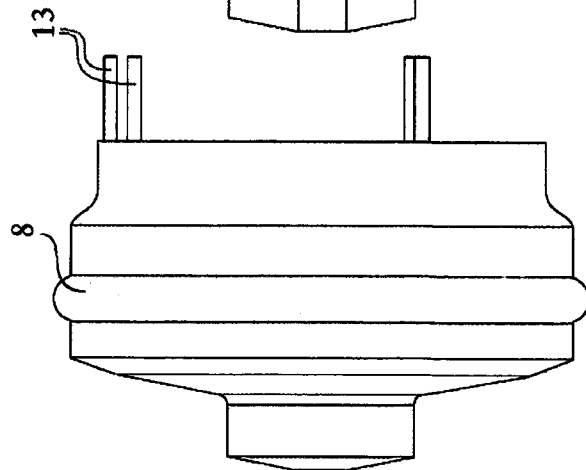


Figure 5

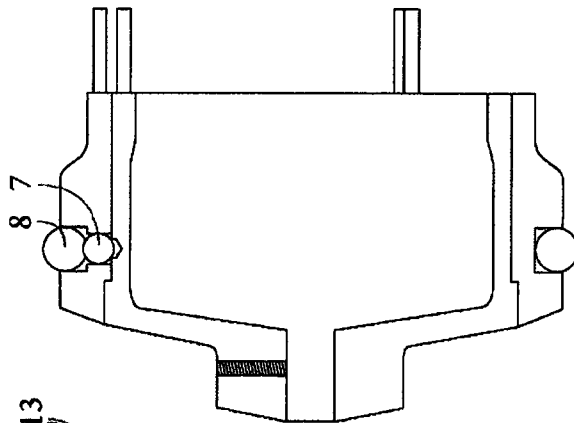


Figure 6

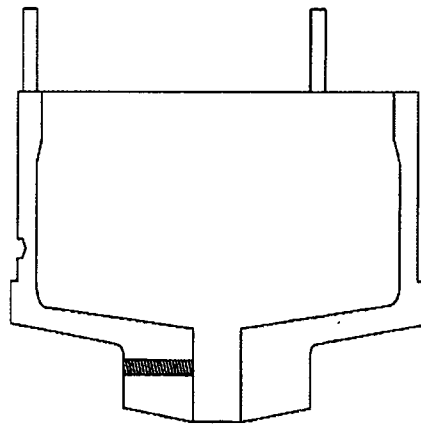


Figure 7

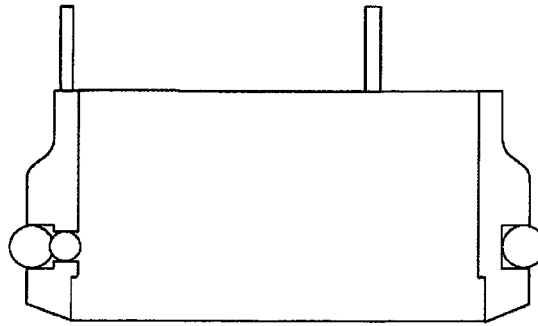


Figure 8

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE2012/000113

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01K, B05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002171867 A (OHARA HIROSHI), 18 June 2002 (2002-06-18); abstract; figures --	1-9
A	JP 1148138 A (OLYMPIC CO LTD), 9 June 1989 (1989-06-09); abstract; figures --	1-9
A	JP 2004283702 A (SHIMANO KK), 14 October 2004 (2004-10-14); abstract; figures --	1-9
A	CN 2548719 Y (LI ZONGSHENG), 7 May 2003 (2003-05-07); abstract; figures --	1-9

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

18-10-2012

Date of mailing of the international search report

18-10-2012

Name and mailing address of the ISA/SE

Patent- och registreringsverket  
Box 5055  
S-102 42 STOCKHOLM  
Facsimile No. + 46 8 666 02 86

Authorized officer

Fredrik Strand

Telephone No. + 46 8 782 25 00

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/SE2012/000113

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 2836034 A1 (HAGENUK NEUFELDT KUHNKE GMBH), 28 February 1980 (1980-02-28); abstract; figures -- -----	1-9

**Continuation of:** second sheet

**International Patent Classification (IPC)**

**B05C 13/02** (2006.01)

**A01K 87/00** (2006.01)

**Download your patent documents at [www.prv.se](http://www.prv.se)**

The cited patent documents can be downloaded:

- From "Cited documents" found under our online services at [www.prv.se](http://www.prv.se)  
(English version)
- From "Anförda dokument" found under "e-tjänster" at [www.prv.se](http://www.prv.se)  
(Swedish version)

Use the application number as username. The password is **BVKVVFZTV**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2012/000113

JP	2002171867 A	18/06/2002	NONE			
JP	1148138 A	09/06/1989	JP	2540570 B2	02/10/1996	
JP	2004283702 A	14/10/2004	CN	100403891 C	23/07/2008	
			CN	1531846 A	29/09/2004	
			JP	4261228 B2	30/04/2009	
			KR	20040083356 A	01/10/2004	
			TW	1320338 B	11/02/2010	
CN	2548719 Y	07/05/2003	NONE			
DE	2836034 A1	28/02/1980	SU	1080752 A3	15/03/1984	