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Remarks:

A request for correction in the description as been filed pursuant to Rule 88 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).

(54) **Support for sewing thread**

(57) The invention refers to a support for sewing thread, destined for winding of sewing threads on the winding machines, for depositing and transporting of thread, as well as for utilization on the special sewing machines from the field of the textile industry.

The solved technical problem consists in the realization of a support which warrants a more secure automatic feeding in the winding machine by preventing the undesirable pressing of the superposed support in the other support.

The support for sewing thread contains three or four stopping teeth (a), theoretical identics, placed between them at an angle of 120° or 90° in the superior zone of the interior wall of support (1), each stopping tooth (a) being a prominence from the interior wall which from the direction of frontal longitudinal view of the stopping tooth (a) has the form of a longish rectangle (a') with long parallel sides with the longitudinal axis of support (1), and in the longitudinal section has the form of a right-angled triangle (a'').

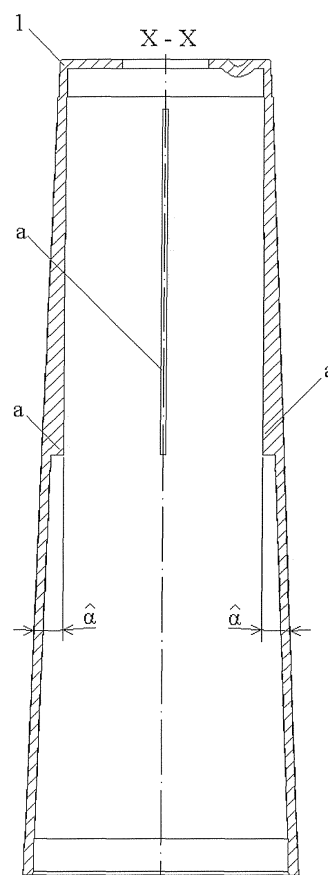


fig. 1

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Description

[0001] The invention refers to a support for sewing thread, having a form of a frustrum of cone or tubular cylinder, destined for winding of sewing thread on different types of winding machines, spoolers, with automatic and / or manual feeding, for depositing and transporting as special package for commercialization of thread, with or without thread wrapped up on it, as well as for utilization on the special sewing machines from the field of the textile industry.

[0002] According to drawings presented in patents RO 113969, RO 115347, US 4106723, US 4705231 and US 5203518, are known many types of tubular supports for textile threads, in the shape of a truncated cone and / or cylinder, which are known too under denomination of format for laying down of textile threads or tubular reel for keeping of different types of thread.

[0003] All these solutions have disadvantage that they are not equipped with elements that would provide an easy automatic feeding of the supports, superposed in handy positions in the winding machine, as well as an ordered packing on several rows, in boxes, by superposition of supports.

[0004] The technical problem, solved by the invention, consists in the realization of a support for sewing thread that warrants a more secure automatic feeding in the winding machine by preventing the undesirable pressing of the superposed support in the other support and that assures handy superposition of supports, with or without thread wrapped up on them.

[0005] The support for sewing thread, according to invention, solves this technical problem and eliminates the mentioned disadvantage that the support for sewing thread, having a form of a straight frustrum of cone with a little coning, corresponding to a utilization in a winding machine, contains three or four stopping teeth, theoretical identics, which in case of overlapping of supports impede the advance of the support in the other support, placed between them at an angle of 120° or 90° in the superior zone of the interior wall of support, each stopping tooth being a prominence from the interior wall which from the direction of frontal longitudinal view of the stopping tooth has the form of a longish rectangle, with long sides, parallel with the longitudinal axis of support, and in the longitudinal section has the form of a right-angled triangle.

[0006] In the variant of fabrication of support for sewing thread, with base having the shape of a truncated cone and with cylindrical or almost cylindrical wrapping surface, with a view of superposition (overlapping) of the supports, wrapped with sewing thread, in the inferior zone of the interior wall of a cylindrical support are provided three interior vertical ribs, theoretical identics, which in case of overlapping of supports impede the advance of the support in the other support, placed between them at an angle of 120°, each rib being a prominence from the cylindrical interior wall which from the direction

of frontal view of the rib has the form of a longish rectangle, with long sides parallel with the longitudinal axis of support, and in the longitudinal section has the form of a rectangle, the length of ribs being dimensioned in such a way that the length of the superior portion of the support for sewing thread, remained free after wrapping of the sewing thread, is a little greater than the length, measured in the direction of longitudinal axis of support, from the bottom ends of the ribs till the end of a ring-shaped portion from inferior zone of the base of support.

[0007] The application of invention conducts to the following advantages:

- due to possibility of overlapping of several supports, one over one, containing or not the thread wrapped up on them, by reduction of the space occupied by the supports, and by easy and handy positioning of them, are improved the automatic winding conditions, as well as the conditions of packing, of depositing and of transportation;
- by avoidance of jamming of supports in case of automatic feeding in the winding machine, are eliminated the rejects obtained for this reason, reducing in this way the damages of fabrication and increasing the productivity of winding;
- due to simplicity, the presented solution can be easily adapted almost at all variants of dimensions and shapes from the family of supports, utilized on different types of winding machines with automatic and / or manual feeding, as well as on different types of special sewing machines with automatic and / or manual feeding.

[0008] In continuation is presented one example of realization of the support for sewing thread, according to invention, in two variants of fabrication, the presentation being upheld by figures 1, 2, ..., 10 and 11, which represent:

- fig.1, longitudinal section, from a plan X-X of fig. 2, of the support for sewing thread, according to example of fabrication in the first variant;
- fig.2, bottom view of the support for sewing thread, according to example of fabrication in the first variant, which shows the positioning of the stopping teeth;
- fig. 3, top view of the support for sewing thread, according to example of fabrication in the first variant;
- fig. 4, longitudinal section of the superior portion of two overlapped supports, executed according to example of fabrication in the first variant, containing a longitudinal view of a stopping tooth and a longitudinal section of another stopping tooth that, for a more clear presentation of the dimensioning of stopping teeth, is drawn at an enlarged scale and with a bigger coning than in reality;
- fig. 5, longitudinal section of two superposed supports, executed according to example of fabrication

in the first variant;

- fig. 6, longitudinal section, from a plan Y-Y of fig. 7, of the support for sewing thread, according to example of fabrication in the second variant;
- fig. 7, bottom view of the support for sewing thread, according to example of fabrication in the second variant;
- fig. 8, longitudinal section of two superposed supports, executed according to example of fabrication in the second variant, which presents schematic also the thread wrapped up on the two supports;
- fig. 9, longitudinal section of four supports, superposed and situated closely, one by one, which presents schematic also the thread wrapped up on each support;
- fig. 10, photographic view of the inferior portion of a support and of the superior portion of another support, executed according to example of fabrication in the first variant, before superposing (overlapping);
- fig. 11, photographic view of the inferior portion of a support and of the superior portion of another support, executed according to example of fabrication in the second variant, before superposing.

[0009] The support for sewing thread, according to example of realization in the first variant of fabrication, consists in that a support 1 (fig. 1, 2 and 3), having a form of a straight frustum of cone with a little coning, corresponding to a utilization in a winding machine, with an angle of inclination of the wall of support $\alpha = 1^{\circ}25'$, contains four stopping teeth a, theoretical identics, placed between them at an angle of 90° in the superior zone of the interior wall of support 1 that has a thickness $g = 1,35$ mm (fig. 4), each stopping tooth a being a prominence from the interior wall which from the direction of frontal longitudinal view of the stopping tooth a has the form of a longish rectangle a', with long sides, parallel with the longitudinal axis of support 1, and in the longitudinal section has the form of a right-angled triangle a'', with an angle of inclination of hypotenuse $\alpha = 1^{\circ}25'$ and with a little cathetus equal with $j + 0,6g$, where:

- j represents the transversal play between interior wall of top support and exterior wall of bottom support, which, with the view of avoidance of jamming of supports overlapped because of some technological deviations of the concentricity, has the value of 0,7 mm; and
- g represents the thickness of the conical support 1, measured as against one horizontal plan in the useful zone of the support, that is in the zone of wrapping of the sewing thread.

[0010] The technological length of positioning of the stopping teeth a, with other words, the distance from the superior end of the straight frustum of cone till the end of the stopping tooth a is calculated with the formula (fig. 4):

$$d = (g + j)\cotg \alpha$$

[0011] So, for a thickness $g = 1,35$ mm, realizable with the help of a mould for plastics mass injection, the technological length of positioning of the stopping teeth a is approximative 82,89 mm.

[0012] Each stopping tooth a, with an aspect of interior rib, has the role of a stopping that, in the automatic feeding phase of the superposed supports (fig. 5 and 10), in the winding machine impedes the advance of the support in other support, facilitating in this way the taking and putting of each support in a working position by intermedium of the arm of a mechanism of a winding machine.

[0013] By case, for overlapping of supports can be utilized also three stopping teeth, positioned between them at an angle of 120° .

[0014] The support for sewing thread, according to example of realization in the second variant of fabrication, consists in that, with the view of overlapping of supports, with or without sewing thread wrapped on them, in the inferior zone of the interior wall of a cylindrical support 2 (fig. 6 and 7) are provided three interior vertical ribs b, theoretical identics, which in case of overlapping of supports impede the advance of the support in the other support, placed between them at an angle of 120° , each rib b being a prominence from the cylindrical interior wall which from the direction of frontal view of the rib b has the form of a longish rectangle b', with long sides parallel with the longitudinal axis of support 2, and in the longitudinal section has the form of a rectangle b'', having the little side equal with $v + 0,6z$, where:

- v represents the transversal play (fig. 8) between interior wall of inferior zone of the top support and exterior wall of superior zone of the bottom support, which, with the view of avoidance of jamming of supports overlapped because of some technological deviations of the concentricity, has the value of 0,6 mm; and
- z represents the thickness of the support 2 (fig. 6), measured at the base of the ribs b, having the value of 0,9 mm.

[0015] The length of ribs b is dimensioned in such a way that the length of the superior portion of the support 2 for sewing thread, remained free after wrapping of the sewing thread, is a little greater, with 0,8 mm (fig. 8 and 9), than the length, measured in the direction of longitudinal axis of support 2, from the bottom ends of the ribs till the inferior base of support, that is till the end of a ring-shaped portion c from inferior zone of the base of support 2.

[0016] In case that the diameter of the volume of thread wrapped up is smaller than the diameter of the ring-shaped portion c from the zone of base of support 2, by putting of the supports 2, one above one and one beside

one (fig. 9 and 11), the exterior helical thread, wrapped up on support, is protected against deterioration in phase of depositing and transportation, as well as in different phases of automatic feeding of the supports in the winding machine, because it is not touched by the thread of neighbouring support, although the supports are positioned, one beside one, closely enough.

[0017] In order to assure in the winding phase a good adhering of the thread and a uniform placing of the thread on the surface of support, each support has a surface, processed by reticulating (randalieren), with small dents, having a form of small single or double prominences, or a surface striated in relief, in a form of helical spiral with very small step, in depth of 0,1 mm.

[0018] The supports for sewing thread, provided with the interior stopping teeth a or with the interior ribs b, are realized with the help of some machines and moulds for plastics mass injection from light and resistant mass plastics, as for example the family of polypropylenes.

[0019] In addition to the solutions presented by this invention, also the other variants of dimension and shape of the supports for different types of thread, utilized up to the present at different types of winding machines, can be provided with the interior stopping teeth or with the interior ribs, according to the present invention. The technology of adaptation consists in fact that on the base of the dimensions of the interior stopping teeth or ribs, projected for each case, are modified the depths of the moulds for supports injection by milling or electroerosion of some grooves in a form of longitudinal trenches.

[0020] At some supports for sewing thread, which are provided with cylindrical or almost cylindrical ends, the interior longitudinal sides of the stopping teeth or of the ribs can have also a guiding role of the cylindrical superior end of the other support. In these cases, for assuring of a guiding of good quality, at fabrication of the moulds for supports injection are utilized some more precise devices and machines.

[0021] List of reference signs used in the figures 1 ... 11

- 1 : support
- a : stopping tooth
- a' : rectangle
- a" : right-angled triangle
- 2 : support
- b : rib
- b' : rectangle
- b" : rectangle
- c : ring-shaped portion

Claims

1. Support for sewing thread, having a form of a straight frustrum of cone with a little coning, **characterised in that**, with the view of preventing the undesirable pressing of the superposed support in the other support, contains three or four stopping teeth (a), the-

oretical identics, placed between them at an angle of 120° or 90° in the superior zone of the interior wall of support (1), each stopping tooth (a) being a prominence from the interior wall which from the direction of frontal longitudinal view of the stopping tooth (a) has the form of a longish rectangle (a'), with long sides, parallel with the longitudinal axis of support (1), and in the longitudinal section has the form of a right-angled triangle (a").

2. Support for sewing thread, according to claim 1, **characterised in that**, with the view of avoidance of jamming of supports overlapped because of some technological deviations of the concentricity, the little cathetus of the right-angled triangle (a") has a dimension equal with 0,7 mm + 0,6g, where g represents the thickness of the conical support (1), measured as against one horizontal plan in the zone of wrapping of the sewing thread.
3. Support for sewing thread, according to claim 1 and 2, **characterised in that** the technological length of positioning of the stopping teeth (a) is calculated with the formula:

$$d = (g + j) \cotg \alpha \quad ,$$

where α represents the angle of inclination of the wall and j represents the transversal play between interior wall of top support and exterior wall of bottom support.

4. Support for sewing thread, with base having the shape of a truncated cone and with cylindrical or almost cylindrical wrapping surface, **characterised in that**, with the view of overlapping of supports, with or without sewing thread wrapped on them, in the inferior zone of the interior wall of a cylindrical support (2) are provided three interior vertical ribs (b), theoretical identics, which in case of overlapping of supports impede the advance of the support in the other support, placed between them at an angle of 120°, each rib (b) being a prominence from the cylindrical interior wall which from the direction of frontal view of the rib (b) has the form of a longish rectangle (b'), with long sides parallel with the longitudinal axis of support (2), and in the longitudinal section has the form of a rectangle (b"), having the little side equal with 0,6 mm + 0,6z, where z represents the thickness of the support (2), measured at the base of the ribs (b).
5. Support for sewing thread, according to claim 4, **characterised in that** the length of the superior portion of the support (2) for sewing thread, remained free after wrapping of the sewing thread, is greater

with 0,8 mm than the length, measured in the direction of longitudinal axis of support **(2)**, from the bottom ends of the ribs **(b)** till the end of a ring-shaped portion **(c)** from inferior zone of the base of support **(2)**.

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6. Support for sewing thread, according to claim 4 and 5, **characterised in that**, for the protection of the exterior helical thread, wrapped up on support in the phase of depositing and transportation, as well as in different phases of automatic feeding of the supports in the winding machine, the diameter of the volume of thread wrapped up is smaller than the diameter of the ring-shaped portion **(c)** from the zone of base of support **(2)**.

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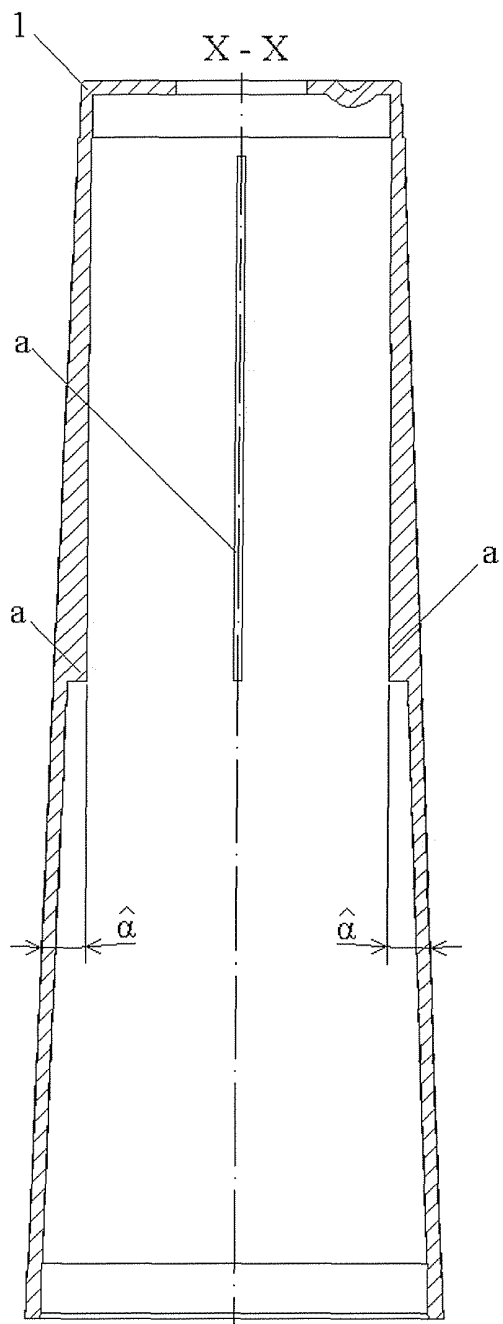


fig. 1

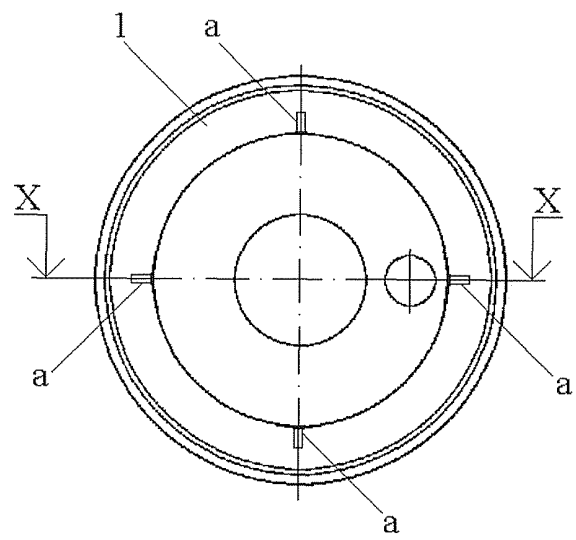


fig. 2

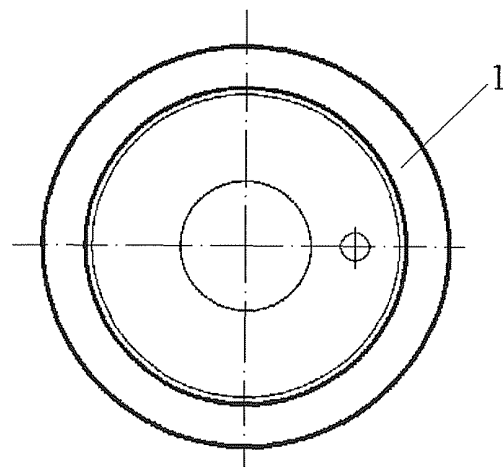


fig. 3

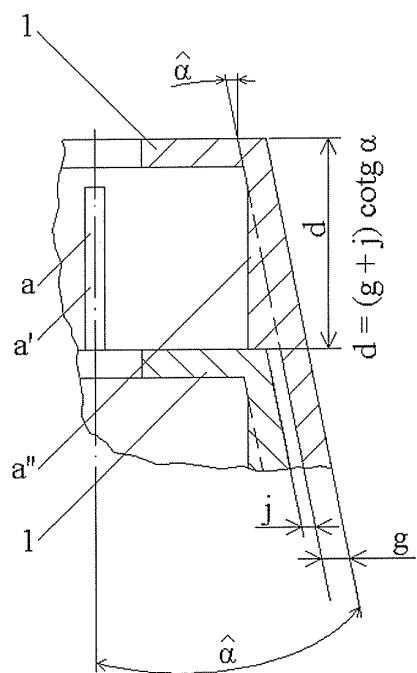


fig. 4

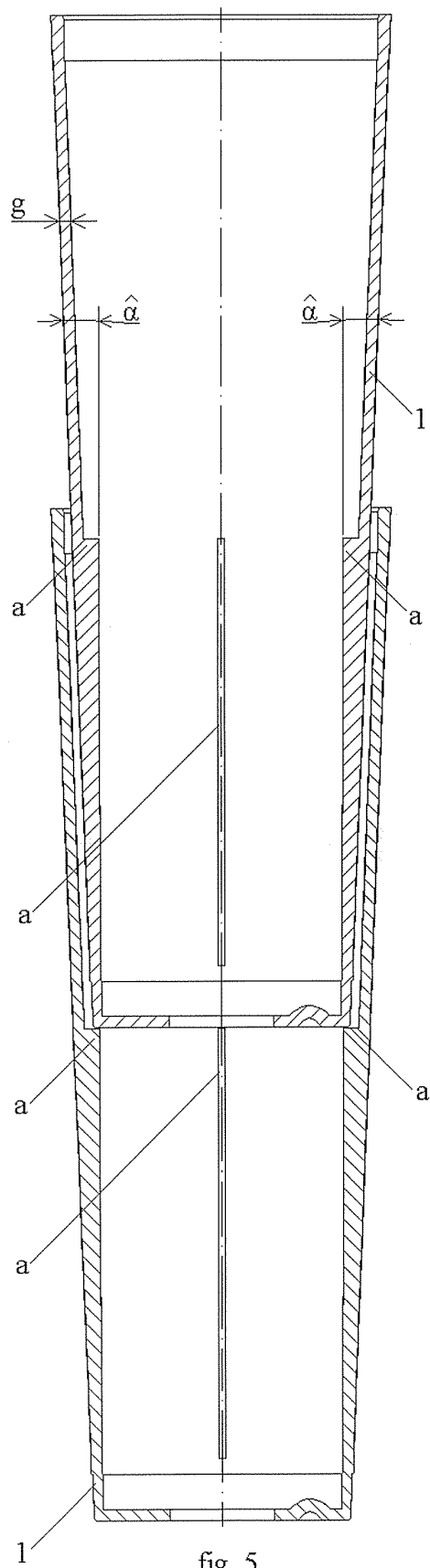


fig. 5

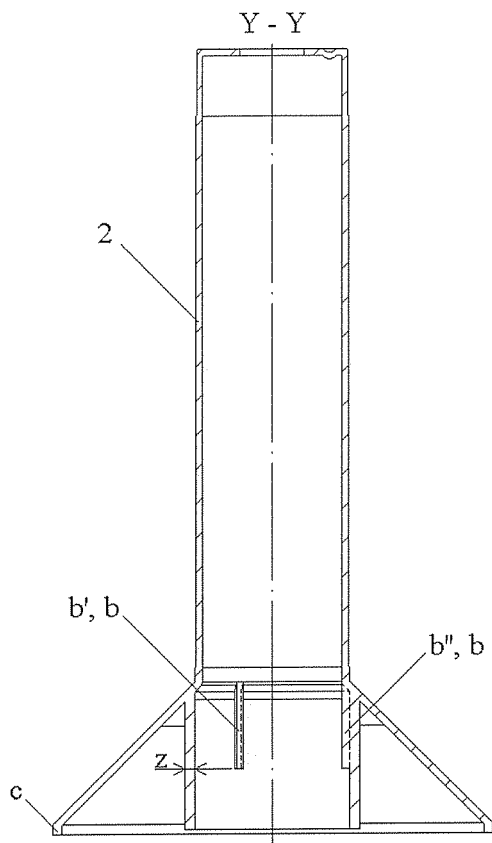


fig. 6

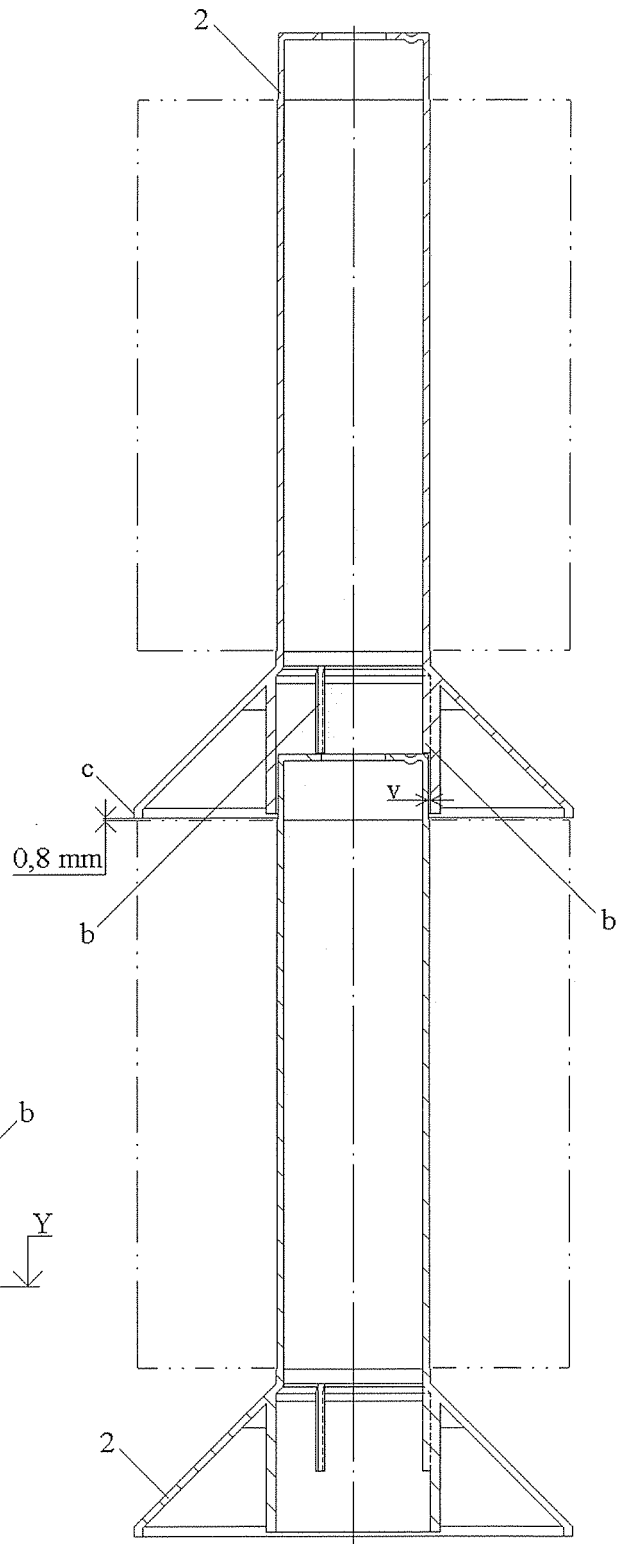


fig. 8

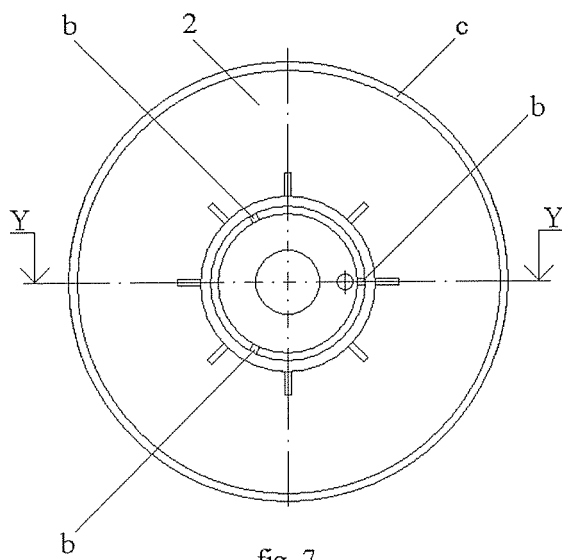


fig. 7

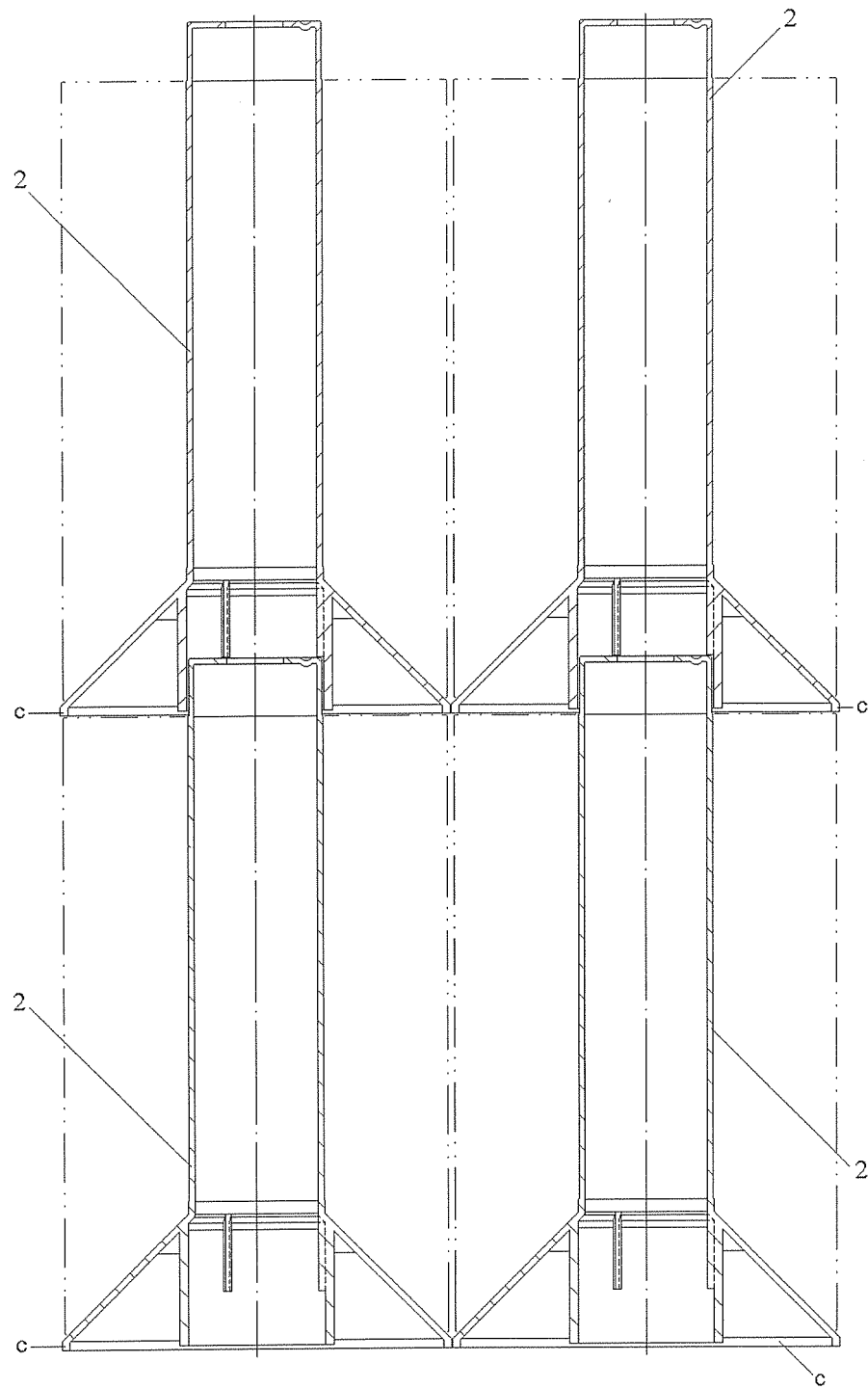


fig. 9

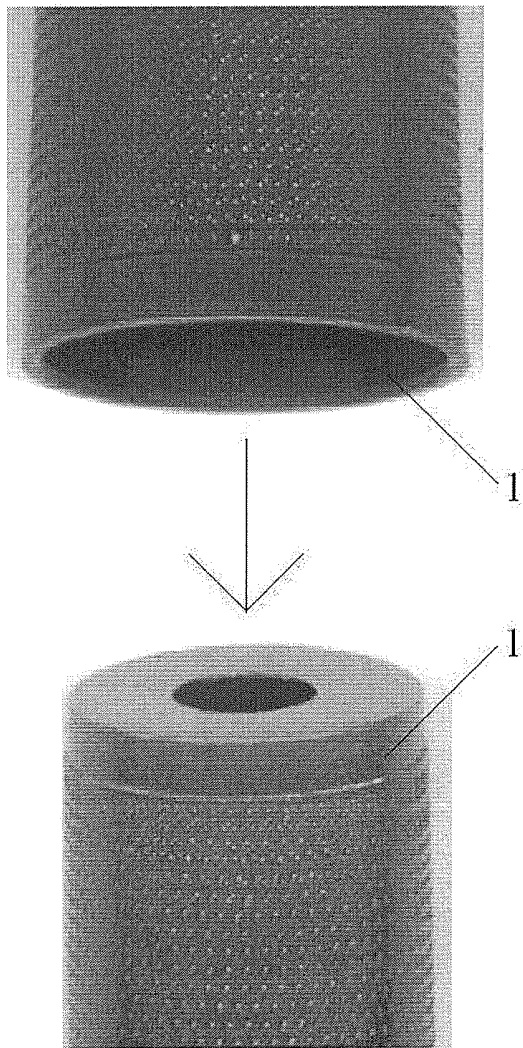


fig. 10

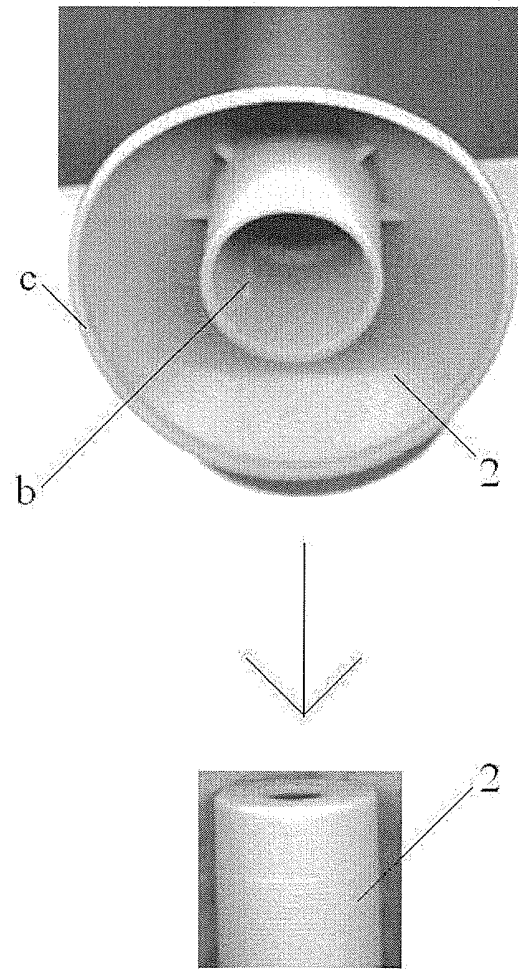


fig. 11

REFERENCES CITED IN THE DESCRIPTION

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- RO 115347 [0002]
- US 4106723 A [0002]
- US 4705231 A [0002]
- US 5203518 A [0002]