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(54) A method for the production of tubular joints for the feeding of liquids and joints obtained with said method

(57) Method for the production of tubular joints (R) for the feeding of liquids, wherein a tubular joint comprises a first and a second section of pipe (32, 35), angularly interconnected and in flow communication. Said joint (R) is produced in a single piece starting from a metallic strip (N) by means of shearing, deep-drawing, pressing, welding and machining.

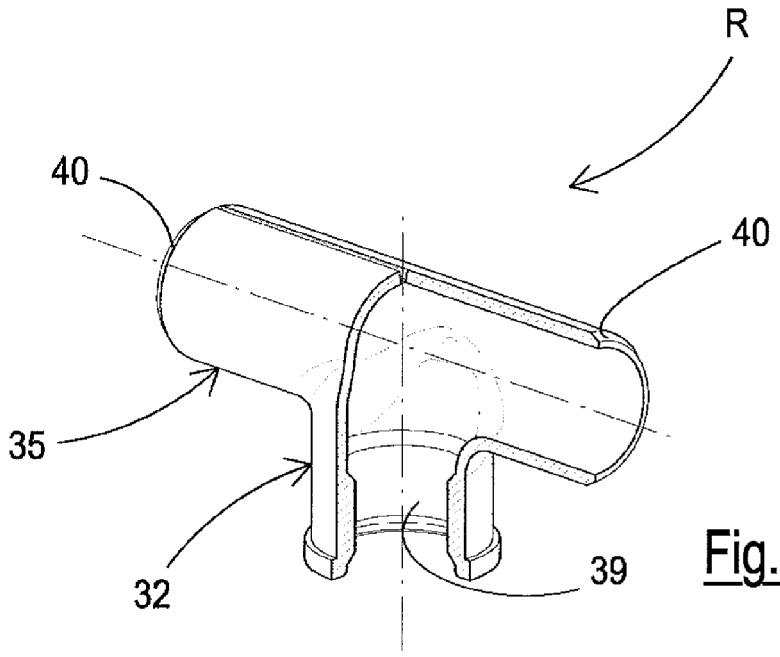


Fig. 11

EP 2 522 440 A1

Description

[0001] The present invention relates to a perfected method for the production of tubular joints for the feeding of liquids, particularly but not exclusively joints used in panel radiators.

[0002] The invention also relates to the joints obtained with an embodiment of this method.

[0003] As is well known to experts in the field, "T"- or "L"-shaped tubular joints for the feeding of liquids, are obtained starting from a first section of pipe, which is centrally blown, by means of pressing, to define a spherical section having a larger diameter.

[0004] A second section of pipe, having a larger diameter with respect to that of the first section, is edged at one end, by pressing, and bevelled at the opposite end: after which said second section of pipe, in correspondence with the bevelled end, is welded to the central spherical part of the first section (central in the case of a "T"-joint, lateral in the case of an "L"-joint).

[0005] The piece thus obtained (for example a "T"-joint) is finally processed with a machine tool to obtain: the pass-through communication hole in the spherical part - in correspondence with the welding - the bevels at the ends, and internal threading of the second section of pipe.

[0006] The formation of the spherical part on the first section of pipe has the function of defining the welding surface of the bevelled end of the section of pipe, which has a larger diameter than that of the first section.

[0007] The production method briefly described above, according to the known art is relatively laborious and consequently costly.

[0008] A general objective of the present invention is to provide a method for the production of tubular joints for liquids - "T"- or "L"-shaped, for example, - which is simpler and consequently more economical with respect to the known methods.

[0009] This objective is achieved by a method comprising the steps specified in claim 1 and enclosed subclaims. The above objective is also obtained by means of a joint obtained through the method claimed.

[0010] The structural and functional characteristics of the present invention and its advantages with respect to the known art, will appear even more evident from the following description, referring to the enclosed schematic drawings, which show the steps of the method of the invention, and examples of joints obtained therewith.

[0011] In the drawings:

- figures 1 to 6 schematically illustrate the production steps of a "T"-joint for liquids according to the known art;
- figures 7 to 11 schematically illustrate the production steps of an example of a "T"-joint according to the present invention;
- figure 12 is a perspective view illustrating an example of an "L"-joint produced using the method according to the invention;
- figure 13 is a perspective view illustrating another example of a "T"-joint produced using the method according to the invention;
- figure 14 is a perspective view illustrating another example of an "L"-joint produced using the method according to the invention; and
- figure 15 is a plan view illustrating the hewed piece of starting metallic strip to obtain the joints of figures 13 and 14.

[0012] With reference first of all to figures 1-6 of the drawings, a known joint of the "T"-type is produced starting from a first section of pipe 20 which, by means of pressing, is centrally blown to form a spherical section or part 21 having a larger diameter than that of the pipe 20 (figures 1 and 2).

[0013] A second section of pipe 22, having a larger diameter than that of the first section 20, is edged as in 23, by means of pressing, at one end, and bevelled as in 24 at the opposite end (figures 3 and 4).

[0014] The section of pipe 22 is then welded, as in 25, in correspondence with the bevelled end as in 24, at the central spherical part 21 of the first section 20.

[0015] The piece thus obtained is then processed with a machine tool to obtain: a pass-through hole 26 in the spherical part 21, for communication between 20 and 22, bevels 27 at the free ends of the section of pipe 20, and a threading on the inner surface 28 of the section of pipe 22 (figures 5 and 6).

[0016] Joints produced with the method described above according to the known art, are relatively laborious to produce and consequently costly.

[0017] A tubular joint for liquids according to the invention, on the contrary, is produced in a single piece, as illustrated in figures 7-15 of the drawings.

[0018] Instead of starting from two sections of pipe, as described above, the joint is produced in a single piece of plate sheared from a suitable metallic strip, deep-drawn, pressed, welded and processed with a machine tool.

[0019] More specifically, a hewed piece 30 is sheared from a metallic strip N, from whose longitudinal edges two arched sections 31 extend.

[0020] A first section of pipe 32 is obtained from the same hewed piece 30, by means of deep-drawing operations, also thanks to the presence of the necessary additional material, provided by the opposing arched sections 31, which almost completely withdraw (figures 7 and 8). An edge 38 is also obtained by pressing.

[0021] A part 33 (with a substantially semi-circular transversal section) is then defined from the semi-processed piece of figure 8, by means of other forming operations, with flaps 34, of a second section of pipe 35, which is then completed by the shearing and bending of the above flaps 34, and reciprocal abutment of the longitudinal edges 36, which are welded to each other as in 37 (figures 9 and 10).

[0022] The piece of figure 10 is then processed with a machine tool to produce a threading in the area 39 and bevels 40 at the free ends of the section 35 (figure 11).

[0023] Figures 12-14 are perspective views illustrating examples of "T"-shaped and "L"-shaped joints R, produced according to the characteristic method of the invention, wherein the "T"-shaped joint of figure 13 has a central spherical part having a larger diameter (contrary to that illustrated in figures 10 and 11).

[0024] The "L"-shaped joints of figures 12 and 14 are provided with a welded end stopper 41, and are respectively lacking in and provided with the central spherical part.

[0025] In figures 12-14 the parts of the joints corresponding to those illustrated in the previous figures have the same reference numbers increased by 100.

[0026] The objective mentioned in the preamble of the description has therefore been achieved.

[0027] The protection scope of the present invention is defined by the enclosed claims.

Claims

1. A method for the production of tubular joints (R) for the feeding of liquids, wherein a tubular joint comprises a first and a second section of pipe (32, 35), angularly interconnected and in flow communication, **characterized in that** said joint (R) is made of a single piece starting from a metallic strip (N) by means of shearing, deep-drawing and welding operations.

2. The method according to claim 1, **characterized in that** it also comprises pressing operations for defining: edges (38) at the free ends, and processings with a tool machine to produce bevels and threads (40, 39).

3. The method according to any of the previous claims, for the production of tubular joints (R) for the feeding of liquids, wherein a tubular joint comprises a first and a second section of pipe (32, 35), angularly interconnected and in flow communication, **characterized in that** it comprises the following phases:

   a. starting from a metallic strip (N);
   b. shearing a flat hewed piece (30) from said strip;
   c. obtaining a first section of pipe (32) from said hewed piece by means of deep-drawing operations;
   d. obtaining a part (33) of a second section of pipe (35) with flaps (34) by means of consecutive deep-drawing operations;
   e. obtaining, by means of shearing and bending operations, said complete second section of pipe (35) by reciprocal abutment of the longitudinal edges (36) of said flaps (34); and
   f. welding said longitudinal edges (36) together, so as to complete the second section of pipe (35), which is in one single piece with the first.

4. The method according to claim 1, **characterized in that** it comprises the following additional phase:

   g. pressing to define edges (38) at the free ends of said sections of pipe.

5. The method according to claims 3 or 4, **characterized in that** it comprises the following additional phase:

   h. processing with a tool machine to produce bevels and threads (39, 40).

6. The method according to claims 3 or 4, **characterized in that** it comprises the following additional phase:

   i) welding of a stopper (41) at a free end of the joint.

7. A tubular joint for the feeding of liquids comprising a first and a second section of pipe (32, 35), angularly interconnected and in flow communication, **characterized in that** it is produced in a single piece of metallic strip.

8. The joint according to claim 7, **characterized in that** it has a "T" configuration.

9. The joint according to claim 7, **characterized in that** it has an "L" configuration.

10. The joint according to claims 8 and 9, **characterized in that** it has a stopper (41) welded to a free end.

Fig. 1

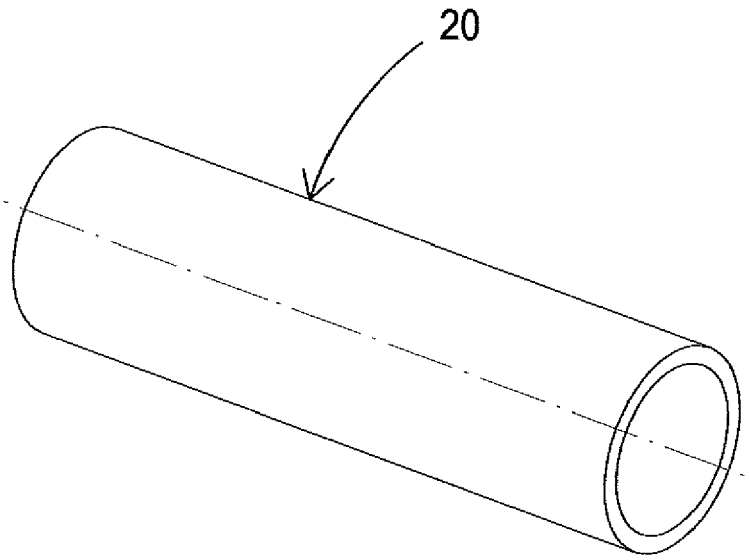


Fig. 2

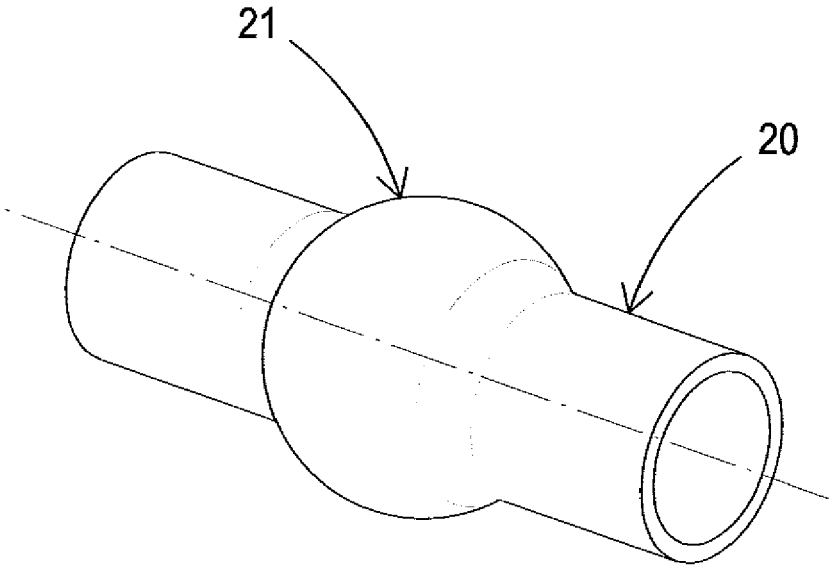


Fig. 3

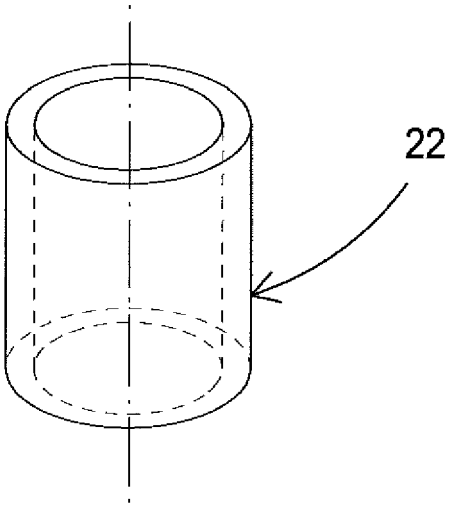


Fig. 4

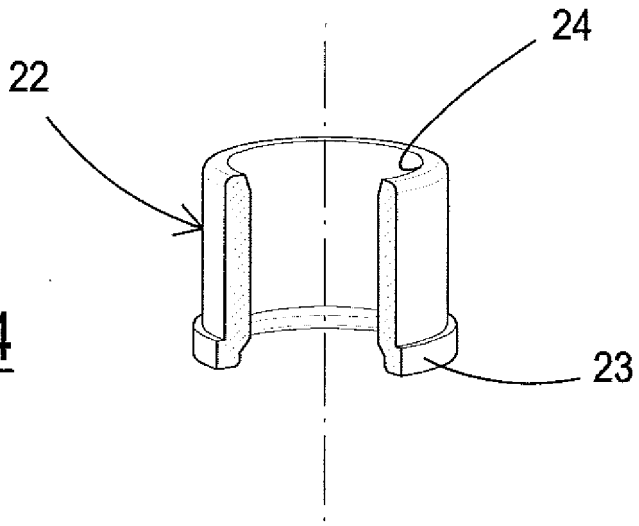
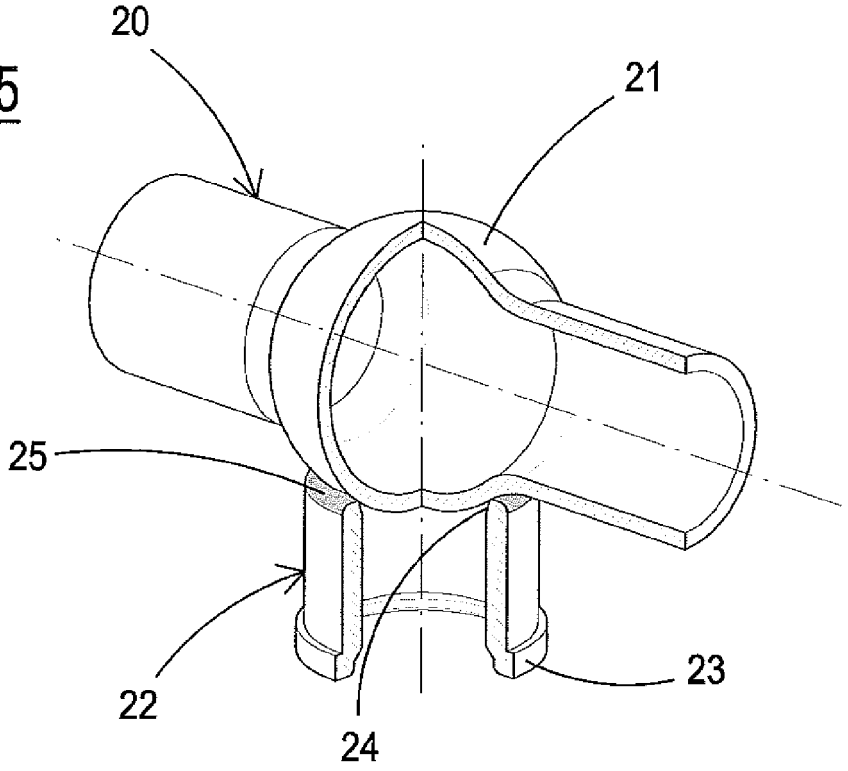


Fig. 5



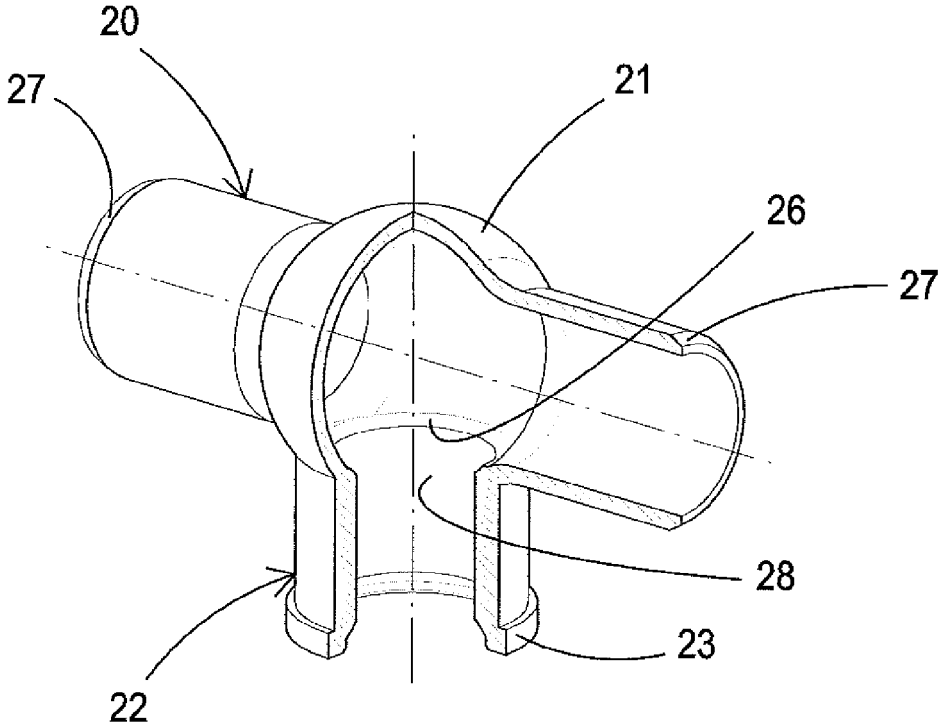


Fig. 6

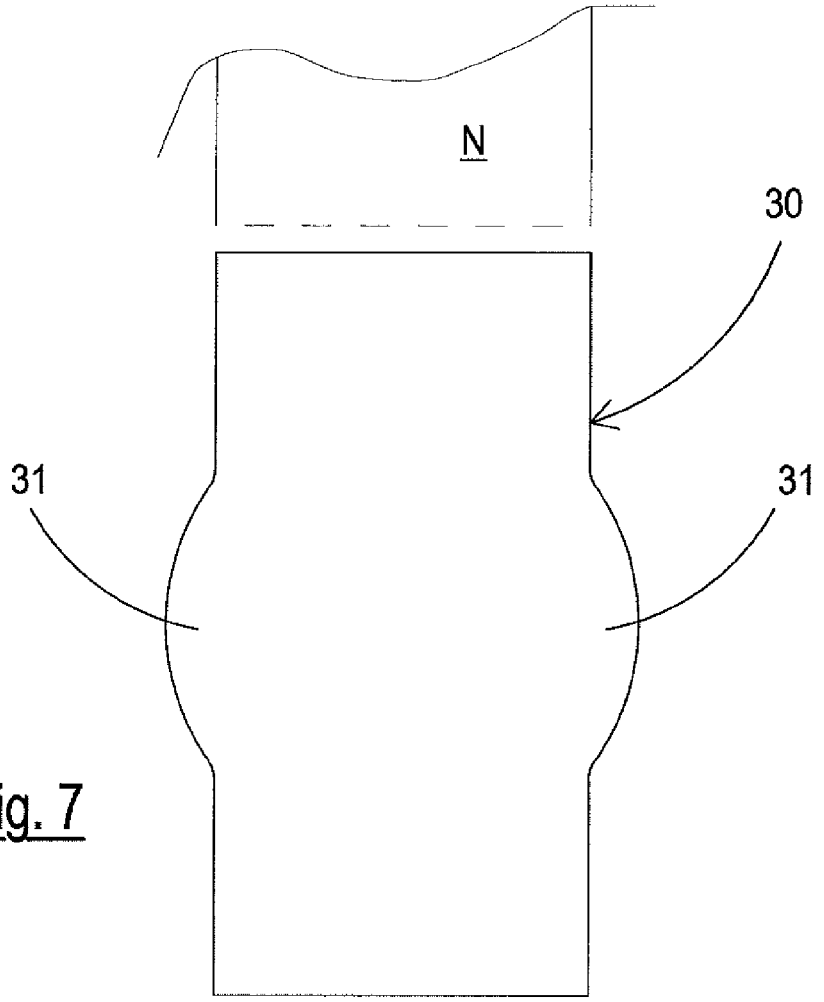


Fig. 7

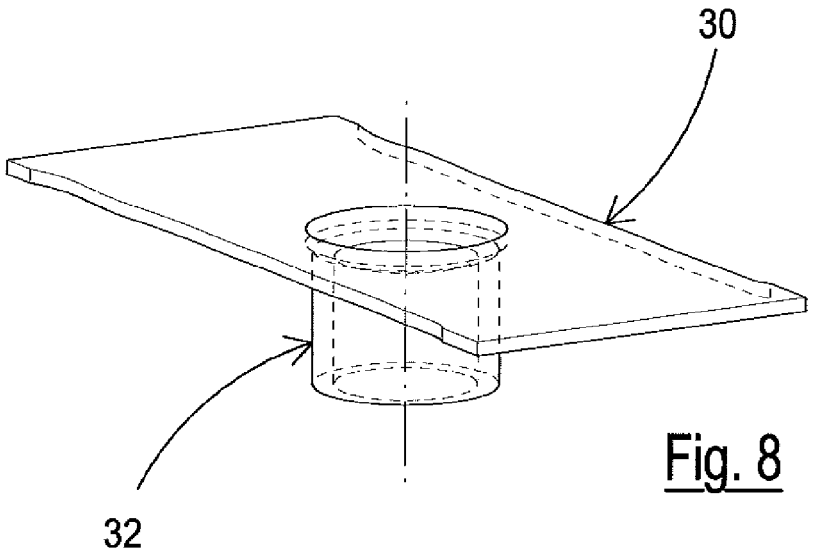


Fig. 8

Fig. 9

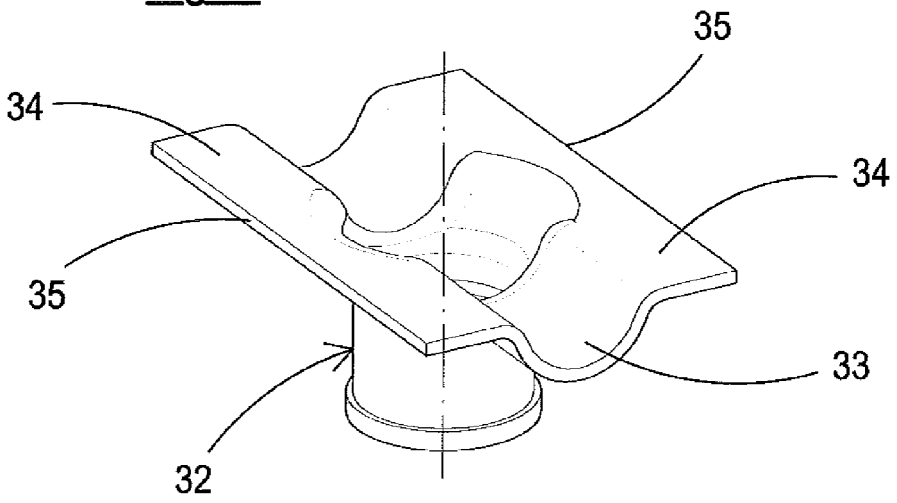
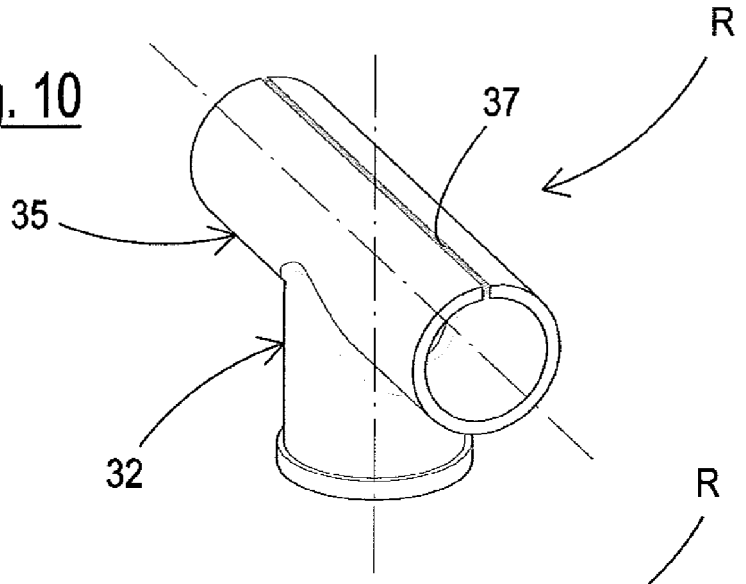


Fig. 10



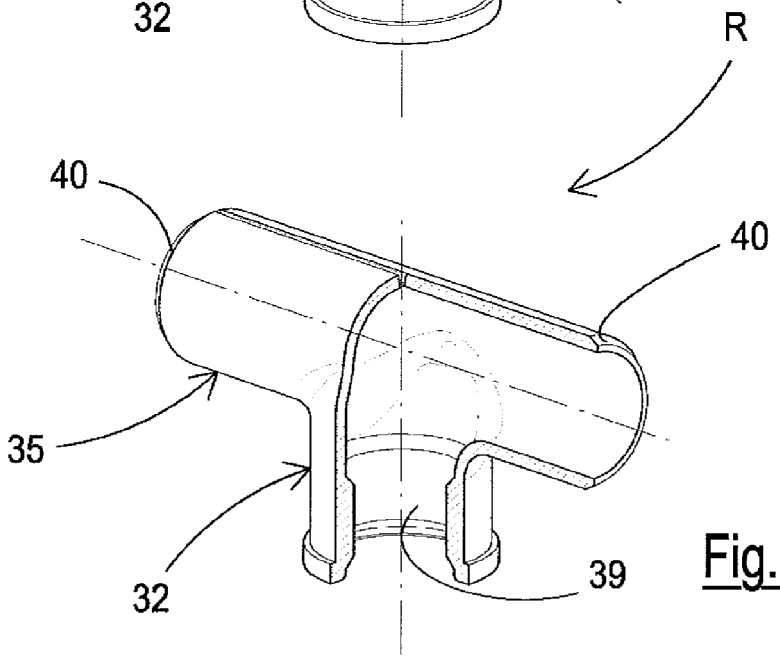


Fig. 11

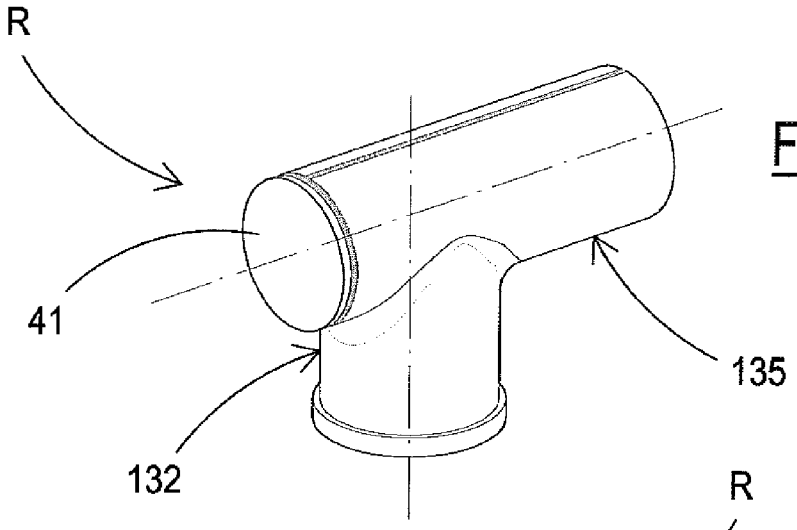


Fig. 12

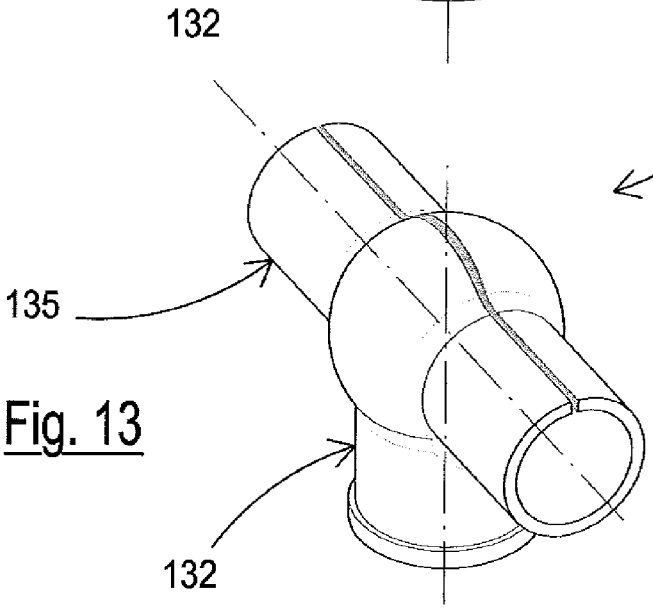


Fig. 13

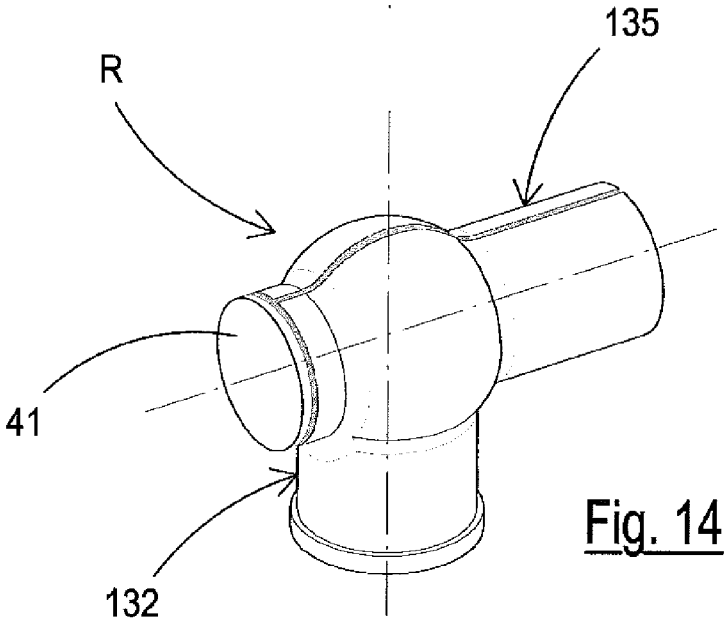


Fig. 14

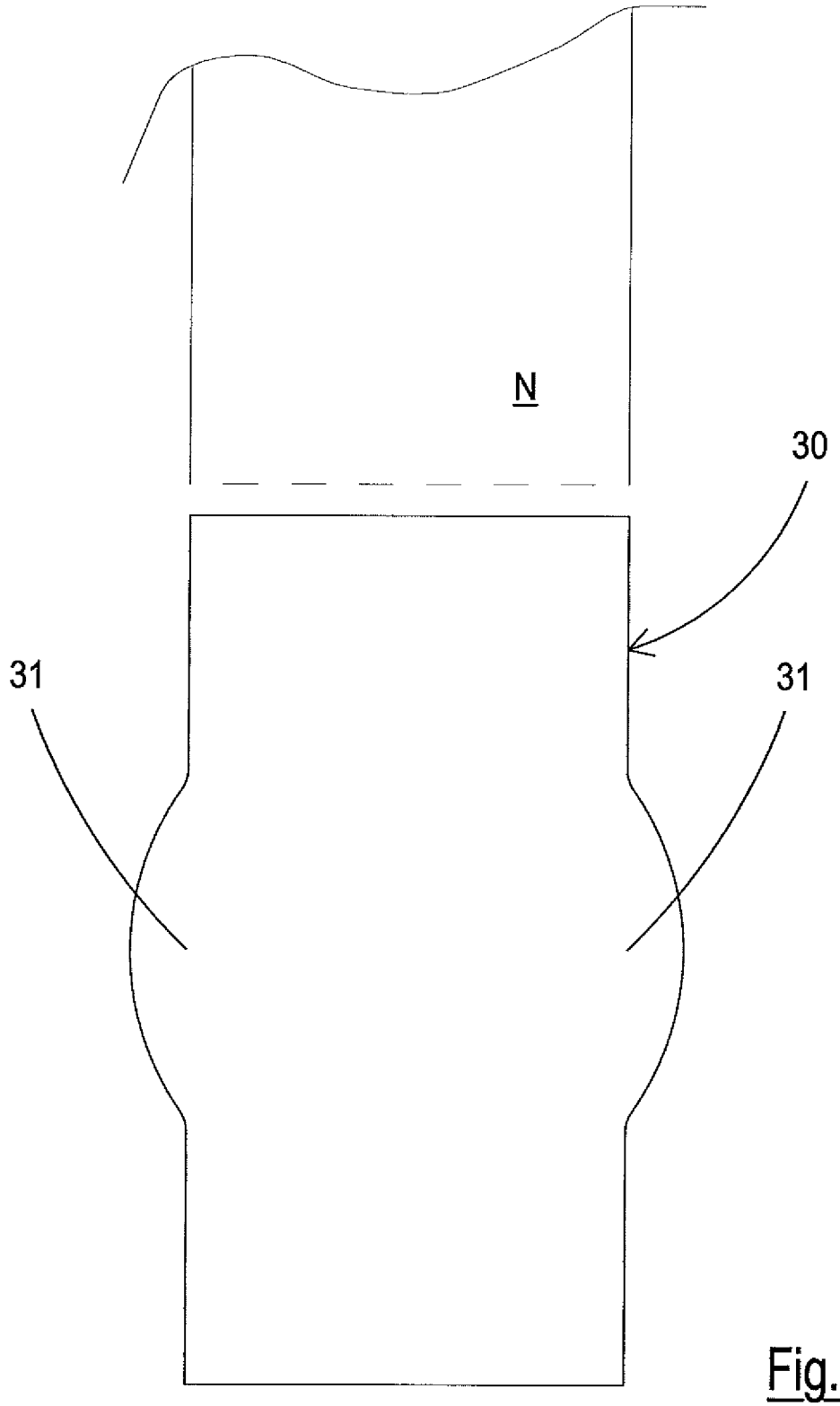


Fig. 15

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 2981

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	US 1 830 262 A (CARLSON HJALMAR G) 3 November 1931 (1931-11-03) * page 1, line 46 - page 2, line 90; figures 1-20 * -----	1-9	INV. B21C37/29
X	JP 58 053329 A (SUMITOMO METAL IND; SUMIKIN KIKO KK) 29 March 1983 (1983-03-29) * abstract; figure 2 * -----	1-10	
X	NL 276 265 A (HANS ZACH) 12 October 1963 (1963-10-12) * claim 1; figures 1-8 * -----	1,7	
			TECHNICAL FIELDS SEARCHED (IPC) B21C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 May 2012	Augé, Marc

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 16 2981

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
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03-05-2012

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