

(19)



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(11)

EP 0 958 762 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
08.01.2003 Bulletin 2003/02

(51) Int Cl.7: **A47B 91/02**

(21) Application number: **99201466.2**

(22) Date of filing: **11.05.1999**

(54) **Extensible table leg with improved locking device**

Verlängerbarer Tischfuss mit verbesserter Verriegelungseinrichtung

Pied de table extensible avec un dispositif de verrouillage amélioré

(84) Designated Contracting States:
BE DE DK ES FI FR GB GR IT NL SE

(30) Priority: **18.05.1998 IT MI981081**

(43) Date of publication of application:
24.11.1999 Bulletin 1999/47

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Description

[0001] The present invention relates to an extensible leg, particularly but not exclusively for tables, writing desks and/or similar support surfaces, the height of which may be adjusted by the user by acting on a foot screwed to the base of the said leg, which foot can be positively locked in the desired position, by means of an improved type of locking device.

[0002] As is well known to the persons skilled in the art, in some cases it would be highly desirable to have access to tables, writing desks and/or similar support surfaces which are provided with legs, the height of which may be adjusted by the user with the utmost ease and accuracy, according to actual requirements, particularly of an ergonomic nature.

[0003] For example, it is advisable to vary the height of the desk/table used by a child, as it grows taller, so as to prevent the possible occurrence of spinal malformations.

[0004] For this purpose, the length of the desk/table's legs should be adjustable within a very wide range, around 15-20 cm for example, also in view of the average height of different people.

[0005] The application of a foot adjustable within such a wide range to the base of the leg does, however, usually give rise to three major technical problems, which need to be resolved.

[0006] First of all, the foot must be mounted on the leg in a manner such as to ensure that the desk/table is stable, above all when the leg is extended to its maximum extent.

[0007] In fact, the legs of such desks/tables may be subject to considerable loads, both top and lateral, above all in the case of work tables.

[0008] It is not a simple matter to meet the above-mentioned table stability requirement, because of the tolerances (clearances) which must always be present between the threads of the screw on the foot and of the female screw on the metal tube of which the leg is made. The clearances between screw and female screw must be left by means of the relatively wide machining tolerances of the metal tube, which oblige the female screw to be placed on a plastic bush fitted at the free end of the tube, rather than directly onto the said tube.

[0009] Furthermore, in view of the loads, including vibratory loads, to which they are subjected when intended to bear machines comprising moving components, such as printers and the like, a positive locking device must be provided between leg and foot which is such as to ensure a stable locking of the foot in the desired position over time, precisely despite the stresses to which the table is subjected.

[0010] This positive locking is essential because, in order to enable the height of the leg to be adjusted in a very short time, the pitch of the threads of screw and female screw have to be long: a further reason for possible instability of the system derives from this.

[0011] By no means the last requirement is the aesthetic one.

[0012] In fact, the foot - above all in the maximum extension position - should have a configuration which does not have a negative influence on the overall aesthetic appearance of the leg.

[0013] The general object of the present invention is to solve the above-mentioned technical problems by providing an extensible leg of the above-mentioned type which has a structure such as to ensure stability to the system, including over time, at the adjusted height, and in which the foot is aesthetically acceptable.

[0014] The above-mentioned object is achieved by a leg with the features quoted in the accompanying Claims.

[0015] The structural and functional features of the invention and its advantages with respect to the prior art will be more clearly understood from a study of the description which follows, with reference to the accompanying drawings, which show a practical embodiment of the said invention and in which:

- Figure 1 is an elevation which shows, in part, a leg with telescopic foot produced according to the teaching of the invention;
- Figure 2 shows the said leg of Fig. 1, partially as a view and partially as a sectional view;
- Figure 3 is an enlarged sectional view showing the coupling and locking system between leg and telescopic foot;
- Figure 4 is an enlarged sectional view of the coupling system between foot and leg;
- Figure 5 is an exploded view showing the ring nut and the sleeve of the coupling and locking system shown in Figs. 3, 4;
- Figures 6, 7 are details showing, in a view and plan view respectively, the coupling and locking system between leg and foot in the unlocked position;
- Figures 8, 9 are details showing, in a view and plan view respectively, the coupling and locking system between leg and foot in the locked position; and
- Figures 10-12 are diagrammatic elevations showing three different possibilities for adjusting one and the same table from a minimum height to a maximum height.

[0016] In Fig. 1 of the drawings, the telescopic leg according to the invention is denoted in its entirety by 10 and is structurally formed by a tubular section 11, of metal for example, onto the base of which a foot 12, generally of plastic, is screwed.

[0017] As can be clearly seen from Figs. 2-4 of the drawings, the foot 12 has a thread 13 with very wide flat crests 14 which screws onto a complementary thread 15 provided on a sleeve 16, also of plastic, forcedly inserted and fixed to the free end of the metal tube 11.

[0018] As can be clearly seen from Figs. 3, 4 of the drawings, according to the invention the sleeve 16 ter-

minates with a truncated cone-shaped internal edge 17 in which a complementary truncated cone-shaped edge 18 of a locking ring nut 19, which is screwed onto the foot 12 by means of a complementary internal thread 20, is wedged and abutted.

[0019] In addition, according to the invention, a plurality of teeth 21 and pads 22, which yield elastically and are intercalated with the said teeth 21 (Figs. 6-9) act between the said truncated cone-shaped edges 17, 18. In the example shown the said teeth 21 and pads 22 are provided on the edge 18 of the ring nut 19, while seats 23 for the above-mentioned teeth 21 are provided on the edge 17 of the sleeve 16.

[0020] The operation of the extensible (telescopic) table leg according to the invention is evident from the above description with reference to the drawings, and is briefly as follows.

[0021] With the ring nut 19 in the unlocked (unscrewed) position of Fig. 6, the foot 12 may be brought (by screwing or unscrewing) into the position corresponding to the desired height, after which this position is stably locked by screwing the ring nut 19, in the direction of the arrow 24, into the position of Figs. 8, 9.

[0022] In this position the teeth 21 of the ring nut 19 engage inside the seats 23 of the sleeve 16 while the pads 22 engage with friction, deforming (Fig. 9), against the truncated cone-shaped edge 17 of the sleeve 16, so as to take up any play, and collaborating with the teeth 21 to initiate a positive locking which is stable over time between ring nut 19 and sleeve 16, i.e. between tube 11 and foot 12.

[0023] The foot 12 thus forms a monobloc with the tube 11, by which means the telescopic leg 10 located in this way is capable of bearing the loads, whether from the top according to arrow 25 or lateral according to arrows 26, without any problem at all.

[0024] Even after some time the foot 12 may be subject to subsequent adjustments, first by unlocking the ring nut 19 (by rotating anti-clockwise to the arrow 24), then adjusting the foot 12 in the new desired position and finally relocking the said ring nut 19.

[0025] For this purpose, the teeth 21 and the seats 23 have respective rounded corners 27, 28 so as to facilitate the disengagement of the ring nut 19 from the sleeve 16.

[0026] The object mentioned in the introduction to the description is thus achieved, in a simple and advantageous manner, and with a foot which is aesthetically acceptable owing to the wide flat-crested threading.

[0027] The protective scope of the invention is defined in the Claims which follow.

Claims

1. Table leg of the type comprising a foot (12) which can be screwed onto a sleeve (16) inserted internally on an end of the leg (11), a locking device suit-

able for locking the foot (12) in the desired position with respect to the leg (11) being provided between the said sleeve (16) and the said leg (11), **characterized in that** the said locking device comprises a ring nut (19) screwed onto the said foot (12) and having a truncated cone-shaped edge (18) suitable for being wedged and abutted against a truncated cone-shaped edge (17) provided at the free end of the said sleeve (16), positive reciprocal locking means being provided between the said two truncated cone-shaped edges (17, 18).

2. Table leg according to Claim 1, **characterized in that** the said locking means consist of the combination: of a plurality of teeth (21) provided on one of the said two truncated cone-shaped edges (17, 18) and a plurality of complementary seats (23) for the said teeth (21) provided on the other truncated cone-shaped edge (17, 18), with a plurality of pads (22) which are elastically yielding and engage with friction between the said two truncated cone-shaped edges (17, 18).
3. Table leg according to Claim 2, **characterized in that** the said teeth (21) and the said seats (23) have respective cooperating rounded corners (27, 28).

Patentansprüche

1. Tischbein von dem Typ mit einem Fuß (12), der in eine Hülse (16) geschraubt werden kann, die innen an einem Ende des Beins (11) eingesetzt ist, einer Sperreinrichtung, die den Fuß (12) in der gewünschten Position in Bezug auf das Bein (11) verriegeln kann und zwischen der Hülse (16) und dem Bein (11) vorgesehen ist, **dadurch gekennzeichnet, dass** die Sperreinrichtung eine Ringmutter (19) umfasst, die auf den Fuß (12) geschraubt ist und einen kegelstumpfförmigen Rand (18) aufweist, der mit einem kegelstumpfförmigen Rand (17), der an dem freien Ende der Hülse (16) vorgesehen ist, verkeilt und an diesen anschlagen gelassen werden kann, wobei ein Mittel zum festen Sperren einer Hin- und Herbewegung zwischen den beiden kegelstumpfförmigen Rändern (17, 18) vorgesehen ist.
2. Tischbein nach Anspruch 1, **dadurch gekennzeichnet, dass** das Sperrmittel aus einer Kombination besteht aus: mehreren Zähnen (21), die an einem der beiden kegelstumpfförmigen Ränder (17, 18) vorgesehen sind, und mehreren komplementären Sitzen (23) für die Zähne (21), die an dem anderen kegelstumpfförmigen Rand (17, 18) vorgesehen sind, wobei mehrere Kissen (22), die elastisch nachgiebig sind, über Reibung zwischen den beiden kegelstumpfförmigen Rändern (17, 18) in Ein-

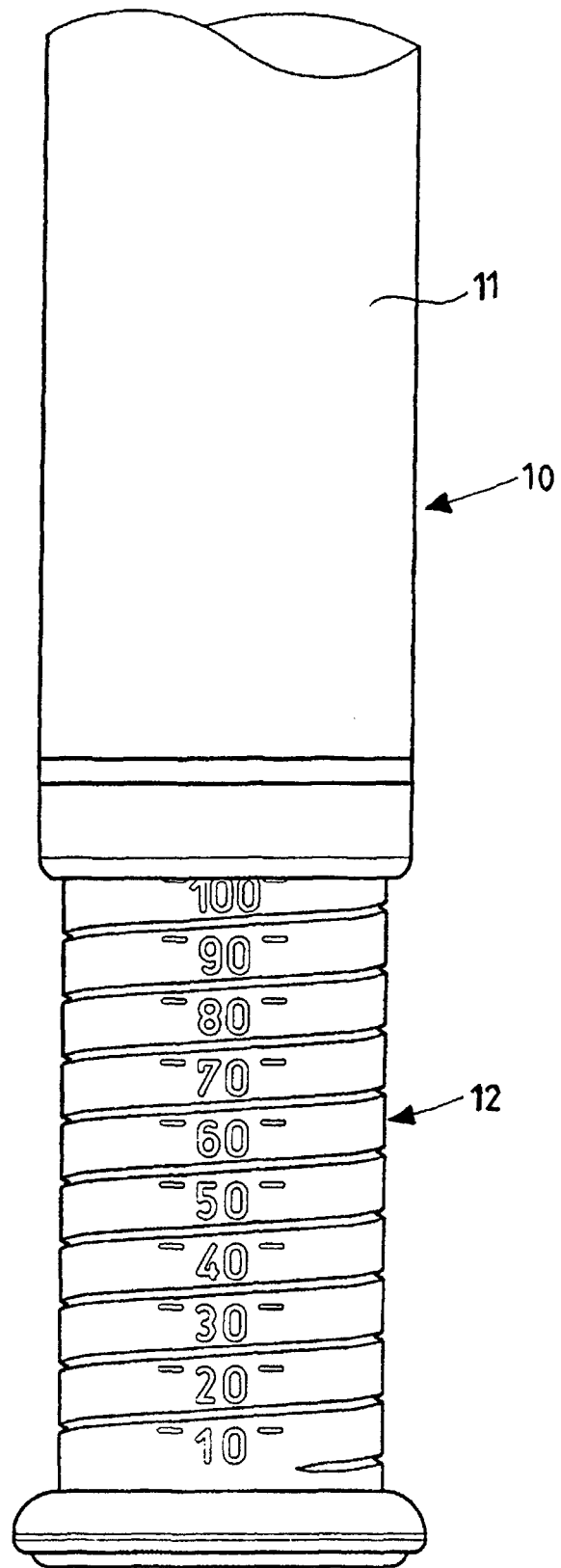
griff stehen.

3. Tischbein nach Anspruch 2, **dadurch gekennzeichnet, dass** die Zähne (21) und die Sitze (23) jeweils zusammenwirkende abgerundete Ecken (27, 28) aufweisen. 5

Revendications

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1. Pied de table du type comprenant une partie de pied (12) qui peut être vissée sur un manchon (16) inséré intérieurement à une extrémité du pied (11), un dispositif de verrouillage approprié pour verrouiller la partie de pied (12) dans la position souhaitée par rapport au pied (11) étant prévu entre ledit manchon (16) et ledit pied (11), **caractérisé en ce que** ledit dispositif de verrouillage comprend un écrou à oeil (19) vissé sur ladite partie de pied (12) et comportant un bord en forme de cône tronqué (18) adapté pour être calé et mis en butée contre un bord en forme de cône tronqué (17) prévu à l'extrémité libre dudit manchon (16), des moyens de verrouillage réciproque positif étant prévus entre lesdits deux bords en forme de cônes tronqués (17, 18). 15 20 25
2. Pied de table selon la revendication 1, **caractérisé en ce que** lesdits moyens de verrouillage consistent en la combinaison d'une pluralité de dents (21) prévues sur l'un desdits deux bords en forme de cônes tronqués (17, 18) et d'une pluralité de logements complémentaires (23) pour lesdites dents (21) prévus sur l'autre bord en forme de cône tronqué (17, 18), avec une pluralité de patins (22) qui fléchissent élastiquement et se mettent en prise par frottement entre lesdits deux bords en forme de cônes tronqués (17, 18). 30 35
3. Pied de table selon la revendication 2, **caractérisé en ce que** lesdites dents (21) et lesdits logements (23) ont des coins arrondis respectifs (27, 28) qui coopèrent. 40
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Fig.1



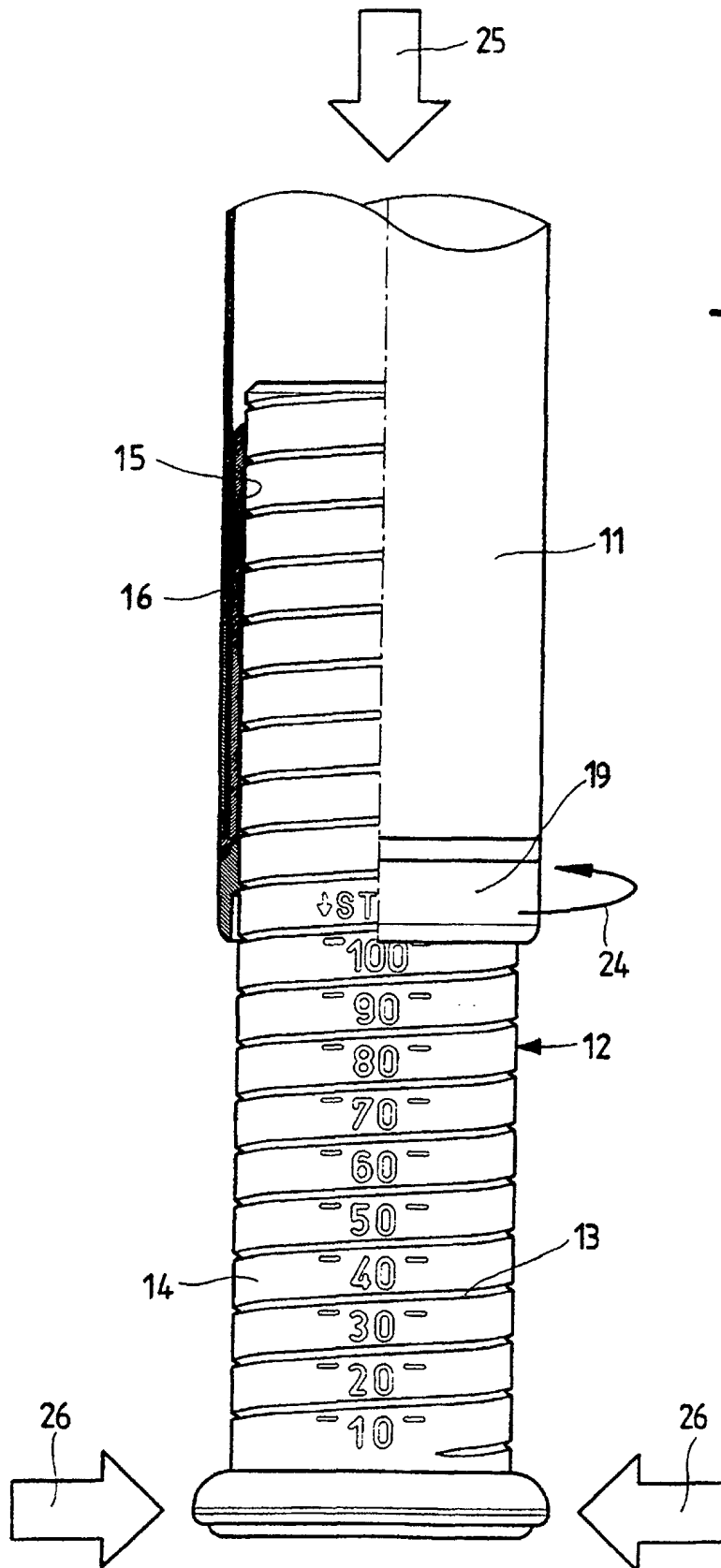


Fig.3

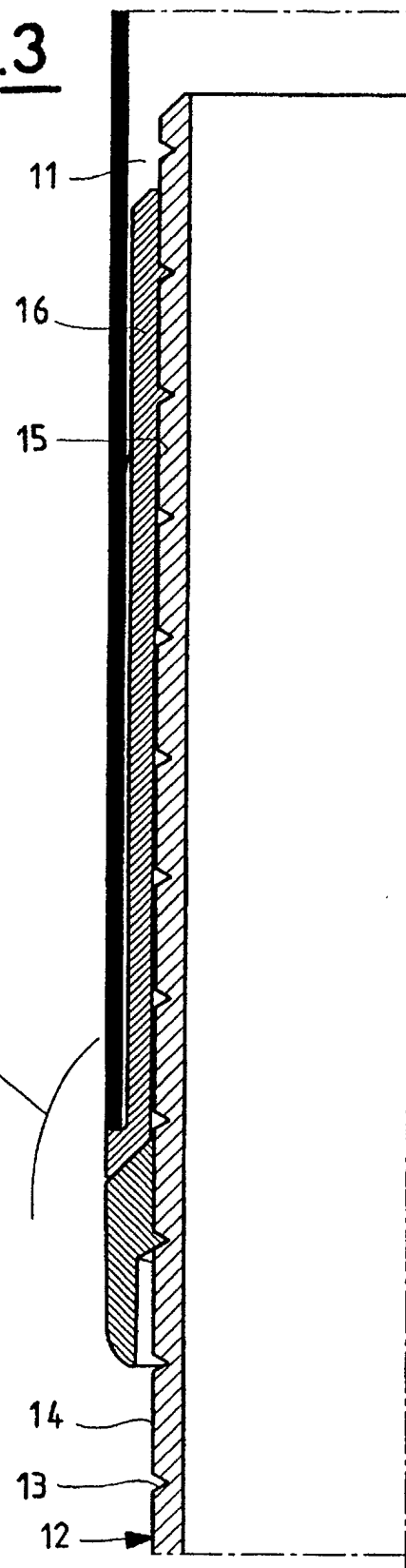


Fig.4

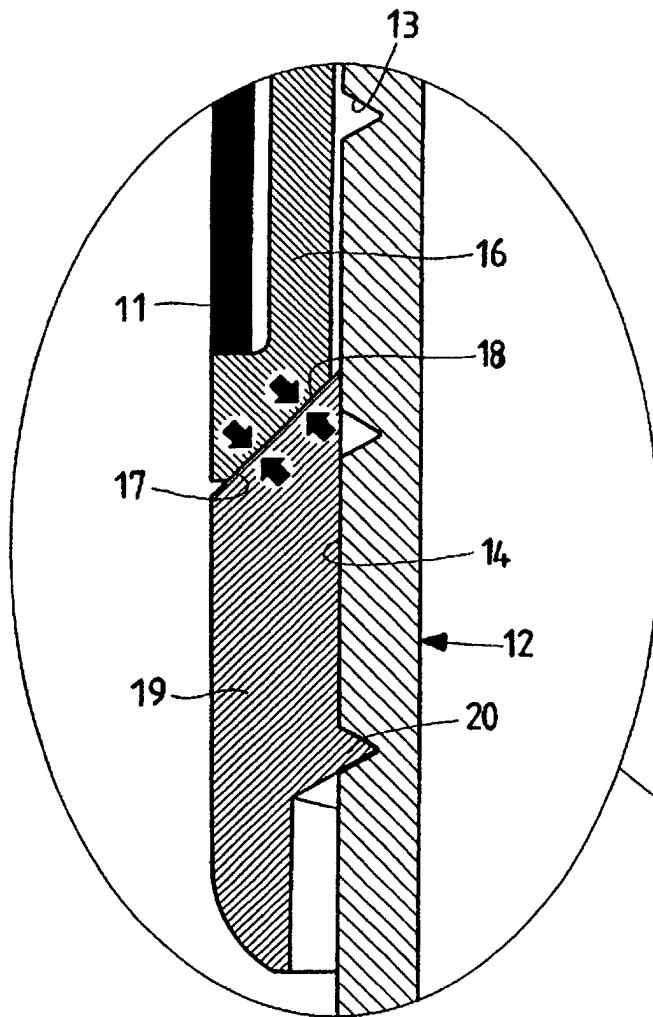
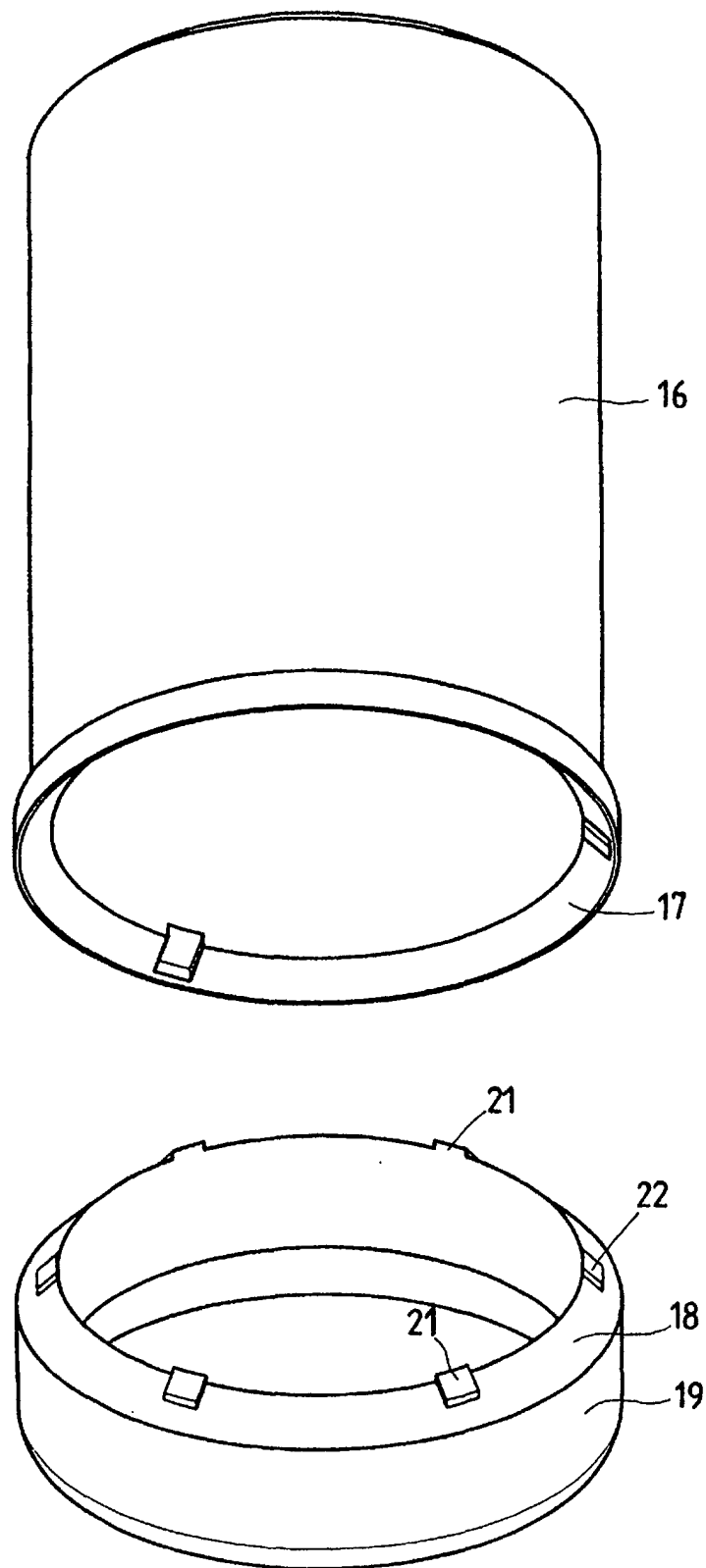


Fig.5



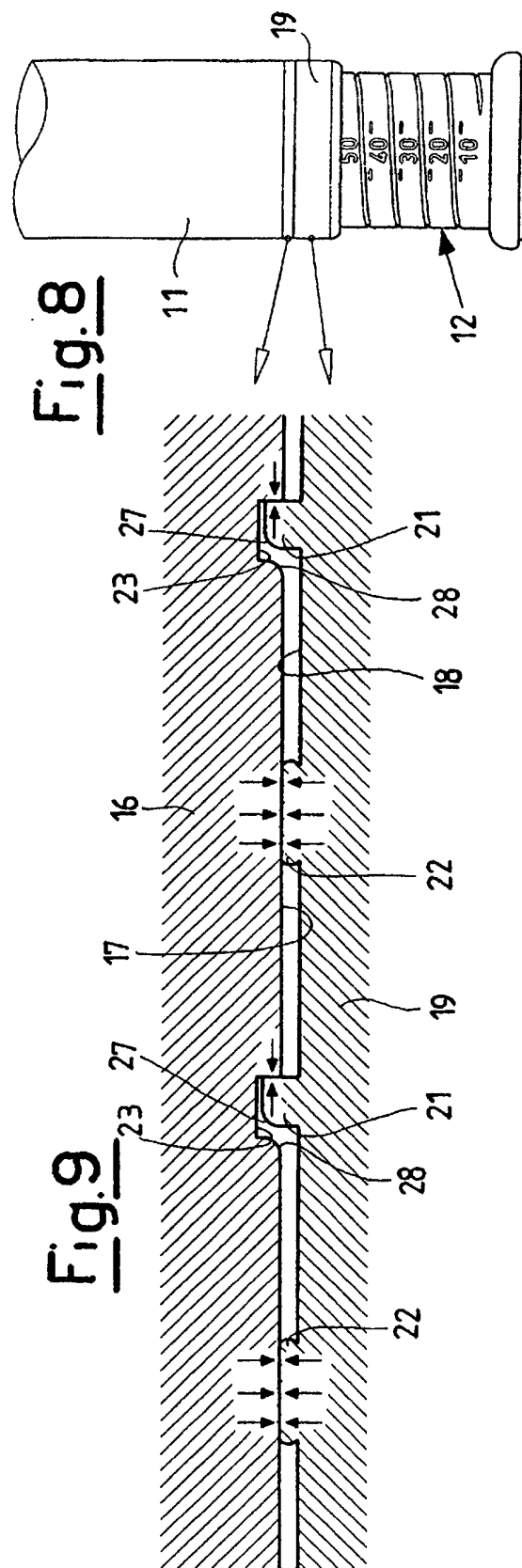
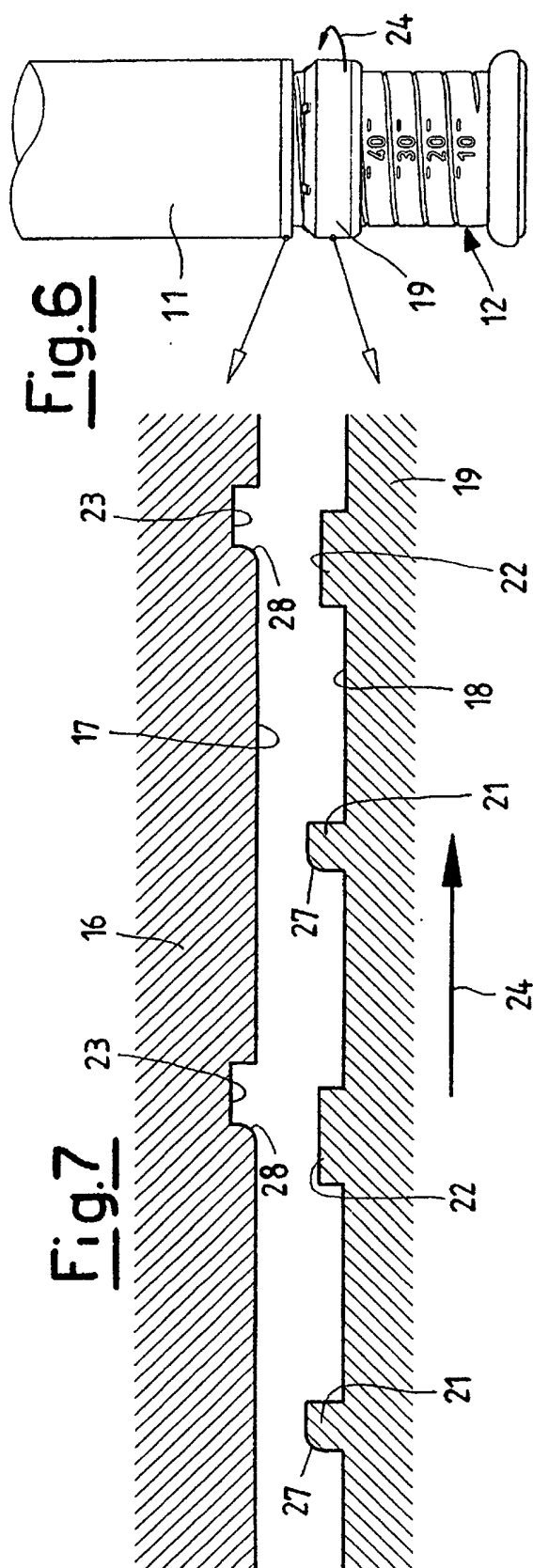


Fig. 8

Fig. 9

