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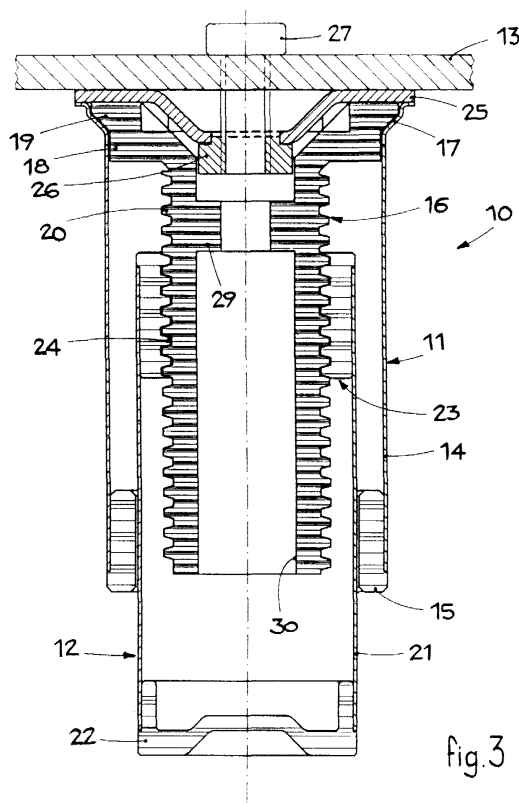
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(54) **Adjustable foot for furniture**

(57) Adjustable foot for furniture, such as industrial kitchens, shelves or similar, comprising an upper element (11), able to be associated to the base (13) of the piece of furniture and provided with threaded male coupling means, and a lower element (12), able to rest on the floor and provided with threaded female coupling

means, wherein said threaded coupling means, male and female, have a trapezoid section and are able to be selectively screwed together to assemble the foot and adjust the height thereof, said lower element (12) comprising a first tubular body (21) inside which said female coupling means (23) are arranged.



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Description

FIELD OF THE INVENTION

[0001] This invention concerns a foot for furniture, such as industrial kitchens, shelves or similar, of the type which can be adjusted in height.

BACKGROUND OF THE INVENTION

[0002] The state of the art includes adjustable feet for furniture consisting of two elements screwed together axially, of which the upper element is able to be attached to the base of the piece of furniture and the lower element is able to rest on the floor.

[0003] Among these, there is a foot made entirely of plastic material wherein the two elements are of a tubular type; the lower element has a thread inside with a triangular section and is able to screw onto a mating threaded insert made by molding inside the upper element.

[0004] There is a good deal of play between the two elements, however, when they are screwed together; therefore one of the elements may become misaligned or angled with respect to the other, especially when the piece of furniture is being used, with a consequent unbalancing thereof and a reduction in the foot's grip and resistance to load.

[0005] Even under optimum assembly conditions, such a foot is able to support at maximum loads of not more than 300-400 Kg, and therefore is not adequate in applications wherein the loads are greater than this.

[0006] The present Applicant has devised and embodied this invention to overcome these shortcomings and to obtain further advantages.

SUMMARY OF THE INVENTION

[0007] The invention is set forth and characterized in the main claim, while the dependent claims describe other characteristics of the invention.

[0008] Purpose of the invention is to achieve an adjustable foot for furniture which will be simple, economical and suitable to support considerable axial loads, even in the range of several tonnes.

[0009] Another purpose of the invention is to achieve an adjustable foot which, when assembled, will always maintain a correct position, in order to transmit the load to the floor efficiently and axially and to prevent the piece of furniture from becoming unbalanced.

[0010] The adjustable foot according to the invention comprises an upper element, provided with male coupling means, and a lower element provided with female coupling means, wherein the coupling means have respective threads with a trapezoid section by means of which the two elements are able to be selectively screwed to assemble the foot and to adjust the height thereof.

[0011] According to a characteristic feature of the invention, the male coupling means are made centrally on the upper element, and the latter is peripherally provided with guide and containing means for the lower element.

[0012] When the foot is assembled, the guide and containing means prevent the lower element from becoming misaligned and/or angled, even if the latter is subjected to lateral or oblique stresses.

[0013] In this way, the foot always keeps its correct assembly position and this factor, combined with the characteristics of construction of the coupling means, gives the foot considerable resistance to the axial load, which can reach and even exceed 2000-3000 Kg, without the foot becoming deformed.

[0014] In a preferential embodiment, the coupling means of the two elements which make up the foot consist of inserts made of plastic material associated inside with respective tubular metal bodies.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] These and other characteristics of the invention will become clear from the following description, given as a non-restrictive example, of some preferential forms of embodiment with reference to the attached drawings wherein:

Fig. 1 is a front view of an adjustable foot according to the invention;

Fig. 2 is a view from above of the foot shown in Fig. 1;

Fig. 3 is an enlarged section of the foot shown in Fig. 1;

Fig. 4 is a front view, partly sectioned, of a variant of the foot shown in Fig. 1;

Fig. 5 is a view from above of the foot shown in Fig. 4;

Fig. 6 is an exploded view of a variant of the adjustable foot according to the invention;

Fig. 7 shows the adjustable foot of Fig. 6 in a partly assembled condition.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0016] With reference to the attached drawings, an adjustable foot 10 for furniture according to the invention substantially comprises two elements which can be screwed together axially; an upper element 11, able to be attached to the base 13 of the piece of furniture, and a lower element 12 able to rest on the floor.

[0017] The upper element 11 comprises a substantially cylindrical tubular body 14; a guide ring 15 is associated with the lower edge thereof, and a male insert 16, threaded on the outside, is housed inside.

[0018] The tubular body 14 is made of metal material, preferentially of stainless steel.

[0019] The guide ring 15 is partly inserted and con-

strained in a snug fit inside the tubular body 14 and partly protrudes from the lower edge of the latter.

[0020] The male insert 16 extends substantially for the entire length of the tubular body 14, so that the lower portion thereof is located inside the guide ring 15.

[0021] The male insert 16 is also provided at the upper part with an external shoulder 18, able to be constrained through interference with the inner wall of the tubular body 14; axially it has a through cavity 30 inside which a circumferential shoulder or protrusion 29 is made.

[0022] In the embodiment shown in Figs. 1-3, the external shoulder 18 is provided with a conical portion 19 able to rest on a wider part 17 of the tubular body 14.

[0023] In the variant shown in Figs. 4-7, the tubular body 14 has a constant cylindrical section and is provided at the upper part with an annular narrow part 33.

[0024] The lower element 12 comprises a tubular body 21, also advantageously made of stainless steel, with an outer diameter slightly less than the inner diameter of the guide ring 15 and closed at the bottom by a stopper 22.

[0025] An internally threaded female insert 23 is constrained in a snug fit inside the tubular body 21 and extends into the upper segment of the latter.

[0026] The female insert 23 is able to be selectively screwed onto the male insert 16 to assemble the foot 10 and adjust the height thereof.

[0027] According to a characteristic feature of the invention, the thread 20 of the male insert 16 and the mating thread 24 of the female insert 23 have a trapezoid section.

[0028] The trapezoid section of the threads 20 and 24 gives the foot 10 a greater resistance to axial load; load tests have in fact shown that the foot 10 is able to support a weight of at least five times more than the weight which an equivalent foot, having threads with a conventional triangular section, can support.

[0029] When the foot 10 is assembled, the guide ring 15, apart from preventing dust and dirt from entering inside the tubular body 14, prevents the lower element 12 from becoming misaligned and/or angled with respect to the upper element 11, even if the foot 10 is subjected to lateral stresses, thus further increasing the mechanical resistance of the latter.

[0030] Moreover, also during the step when they are assembled to the base 13 of the piece of furniture, the elements 11 and 12 of the foot 10 remain perfectly coaxial, improving the conditions of stability of the piece of furniture, and ensuring its level.

[0031] In the embodiment shown in Figs. 1-3, the foot 10 can be assembled on the piece of furniture by associating to the upper element 11 a flange 25 provided centrally with a nut 26 and by screwing into the latter a screw 27 arranged through with respect to the base 13.

[0032] In this condition the male insert 16 is clamped between the wider part 17 of the tubular body 13 and the flange 25.

[0033] In the embodiment shown in Figs. 6 and 7,

wherein the base 13 of the piece of furniture is provided with a threaded seating 28 open towards the bottom, the foot 10 can be assembled by inserting a screw 31 with a washer 32 from below, into the through cavity 30 of the male insert 16, and by screwing the screw 31 into the threaded seating 28 until the washer 32 is made to abut on the annular shoulder or protrusion 29.

[0034] In this condition, the thrust of the external shoulder 18 on the annular narrow part 33, due to the application of the screw 31, causes the tubular body 14 to be substantially clamped between the male insert 16 and the base 13 of the piece of furniture.

[0035] In a preferential embodiment, the male insert 16, the female insert 23, the guide ring 15 and the stopper 22 are made of plastic material, advantageously of reinforced nylon.

[0036] This embodiment reduces the cost of production of these components, prevents oxidation thereof and gives them considerable resistance to the chemical aggression of cleaning products and other substances.

[0037] It is obvious, however, that modifications and/or additions may be made to the foot 10 as described heretofore, but these shall remain within the field and scope of the invention.

[0038] For example, the stopper 22 and the female insert 23 may be made in a single piece and/or be glued to the tubular body 21 of the lower element 12.

[0039] Moreover, between the male insert 16 and the inner wall of the tubular body 14 a suitable glue may be applied able to further improve the coupling of the parts.

[0040] It is also obvious that, although this invention has been described with reference to specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of adjustable foot, but these shall all come within the field and scope of this invention.

Claims

1. Adjustable foot for furniture, such as industrial kitchens, shelves or similar, comprising an upper element (11), able to be associated to the base (13) of the piece of furniture and provided with threaded male coupling means, and a lower element (12), able to rest on the floor and provided with threaded female coupling means, wherein said threaded coupling means, male and female, have a trapezoid section and are able to be selectively screwed together to assemble the foot and adjust the height thereof, the foot being characterized in that said lower element (12) comprises a first tubular body (21) inside which said female coupling means (23) are arranged.
2. Adjustable foot as in Claim 1, characterized in that said female coupling means (23) are made on a first annular insert attached inside said first tubular body

(21).

in that said first and second tubular bodies (21, 14) are made of metal, such as stainless steel or similar.

3. Adjustable foot as in Claim 1, characterized in that said first annular insert is made of plastic material and said first tubular body is made of stainless steel. 5
4. Adjustable foot as in Claim 1, characterized in that said upper element (11) comprises a second tubular body (14) inside which said male coupling means (16) are housed, and in that said second tubular body (14) is internally provided with guide and containing means (15) able to prevent said lower element (12) from becoming misaligned and/or angled with respect to said upper element (11). 10 15
5. Adjustable foot as in Claim 4, characterized in that said guide and containing means comprise a second annular insert (15) attached to said second tubular body (14) in correspondence with its lower edge and inside which said lower element (12) is able to slide. 20
6. Adjustable foot as in Claim 4, characterized in that said male coupling means (16) are made on a cylindrical element coaxial with said second tubular body (14). 25
7. Adjustable foot as in Claim 1, characterized in that said upper element (11) is provided with an axial through cavity (30) inside which at least an element (31) is able to be introduced to assemble said upper element (11) to said base (13). 30
8. Adjustable foot as in Claims 6 and 7, characterized in that said axial through cavity (30) is made inside said cylindrical element coaxial to said second tubular body (14). 35
9. Adjustable foot as in Claim 8, characterized in that said axial through cavity (30) is provided with an annular shoulder or protrusion (29) with which a clamping element (31) is able to collaborate. 40
10. Adjustable foot as in Claim 1, characterized in that a closing element (22) is mounted on the lower part of said first tubular body (21). 45
11. Adjustable foot as in Claims 2 and 10, characterized in that said first annular insert and said closing element (22) are made in a single piece. 50
12. Adjustable foot as in Claim 1, characterized in that said upper element (11) is able to be associated with a flange (25) provided with a nut (26) inside which a screw (27) is able to be screwed to assemble said upper element (11) to said base (13). 55
13. Adjustable foot as in Claims 2 and 6, characterized
14. Adjustable foot as in Claims 2, 5, 6 and 10, characterized in that said first annular insert, said second annular insert (15), said cylindrical element and said closing element (22) are made of plastic material, such as reinforced nylon or similar.

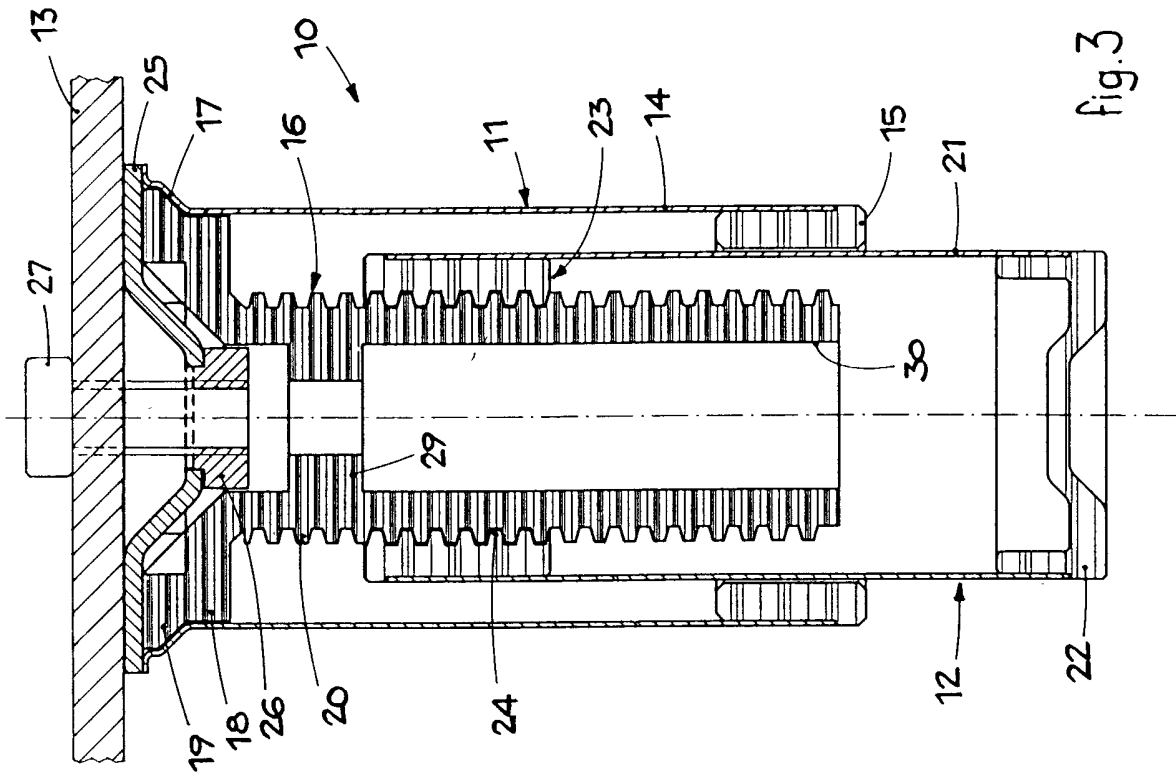


fig.3

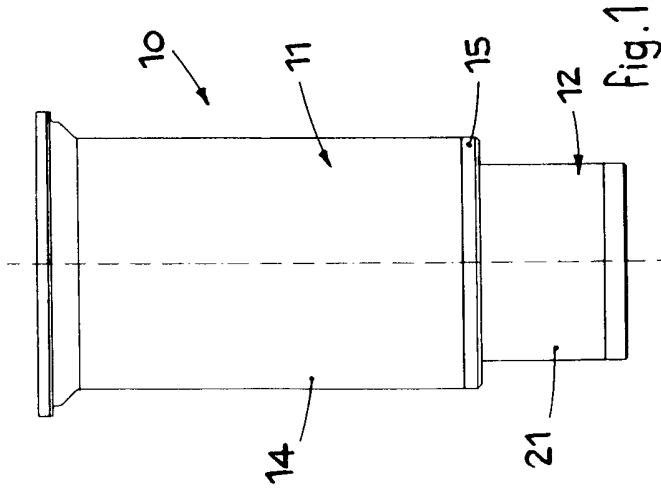


fig.1

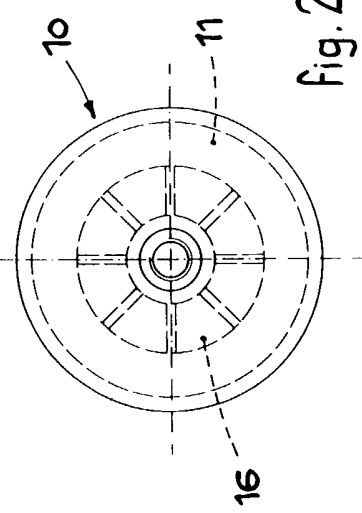
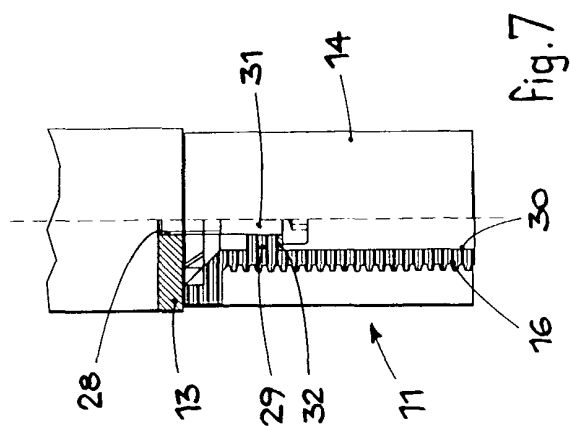
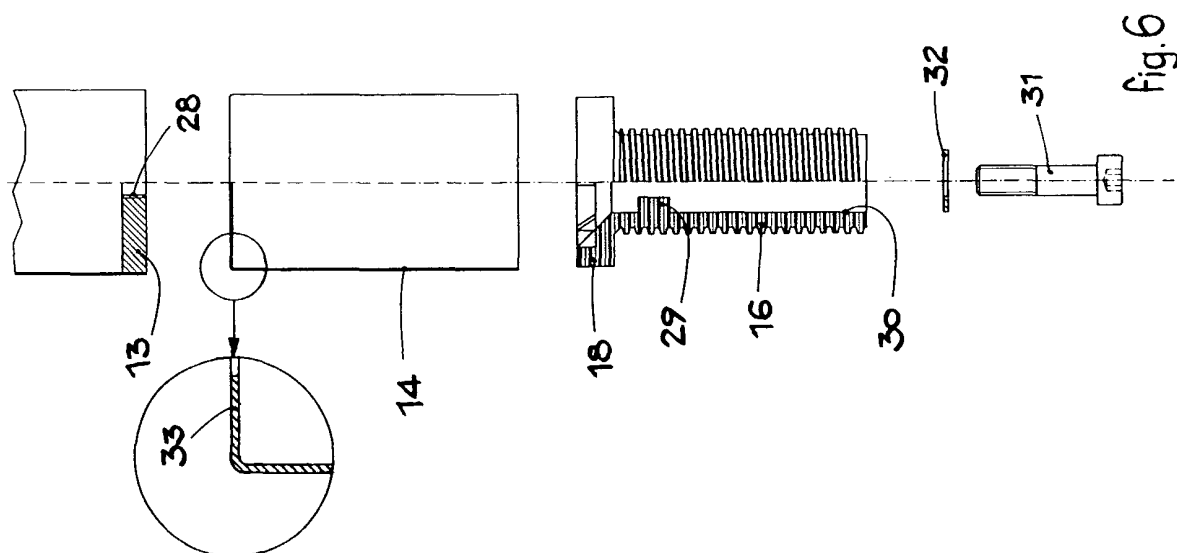
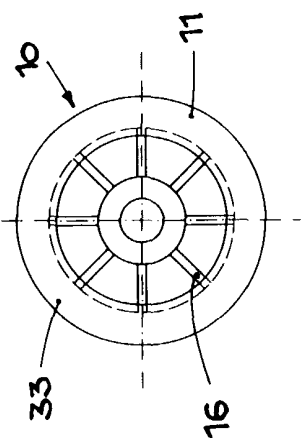
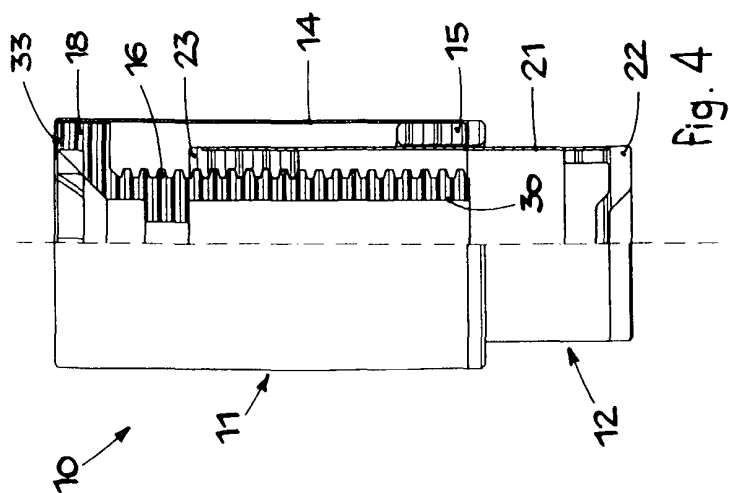


fig.2





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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 0444

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)
X	DE 296 18 177 U (FENNEL GMBH) 2 January 1997 (1997-01-02)	1	A47B91/02
Y	* claims 1,4; figures 1-3 *	1,2,4-6, 10	
Y	--- US 2 956 368 A (KLEIN) 18 October 1960 (1960-10-18) * column 3, line 12 - column 4, line 6; figures 1,2 *	1,2,4-6, 10	
A	--- US 3 383 079 A (COSTANTMI ANTHONY R ET AL) 14 May 1968 (1968-05-14) * column 2, line 17 - column 3, line 16; figures 1-5 *	1,4-8, 11,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A47B D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 May 2001	Examiner Jones, C
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 10 0444

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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22-05-2001

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82