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(54) **Leg for a piece of furniture or the like, as well as a piece of furniture**

(57) The invention relates to a leg suitable for a piece of furniture or the like, comprising a first leg part extending along an axis, a second leg part movably along said axis disposed within said first leg part, a first guide member connected to one of said leg parts, and a first connecting element present on the other leg part for guiding co-operation with said first guide member, which connecting element is provided with two parallel flanks, on which the first guide member engages, wherein some clearance is present between the first guide member and the first connecting element, seen in the direction parallel to said flanks, and also to a piece of furniture comprising at least one such leg.

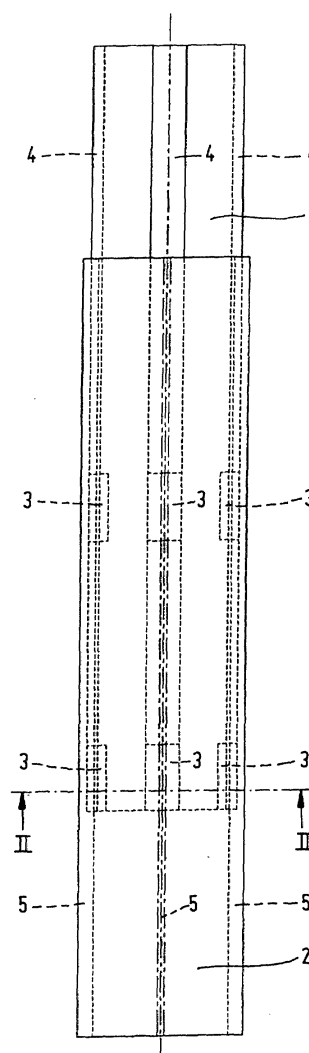


FIG. 1

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Description

[0001] The invention relates to a leg suitable for a piece of furniture or the like, comprising a first leg part extending along an axis, a second leg part movably along said axis disposed within said first leg part, a first guide member connected to one of said leg parts, and a first connecting element present on the other leg part for guiding co-operation with said first guide member, which connecting element is provided with two parallel flanks, on which the first guide member engages.

[0002] Such legs are for example used in office furniture, such as desk chairs or desks, and they make it possible to adjust such furniture for height. Usually, each piece of such furniture is fitted with one, two or four legs. Of late years, the ergonomic demands being made on the workplace have become increasingly stringent. In addition to that, due to the increase of part-time work, among other reasons, the number of people that use one particular workplace is increasing. These facts cause the demand for height-adjustable furniture to grow.

[0003] European patent application EP 0 681 891 discloses a relatively wide telescopic leg of a worktable. Said telescopic leg comprises two leg parts, which can slide along each other, with two opposed slide pieces disposed there between. Each slide piece includes a centrally inwardly extending ridge, which is accommodated in a recess of the inner leg part. Both the free end of said ridge and the remaining, inwardly extending parts of the slide piece are in contact with the inner leg part without any play. As a result, an ambiguous situation may occur, wherein it is unclear which surface of the slide piece is in guiding contact with the inner profile. As a consequence, the construction disclosed therein is very sensitive to production tolerances.

[0004] Dutch patent no. NL 1007396 discloses a telescopic leg comprising a first leg part and a second leg part. Upon manufacture of the leg, a number of guide members are attached to the first leg part, which guide members are so dimensioned that ribs fitted to said guide members project outside the internal surface of the second leg part. When the outside leg part slides over the inside leg part, the projecting part of the guide member is planed off by means of a separate cutting element that is disposed on the bottom side of the second leg part. Legs that have been manufactured in such a way have a number of drawbacks. Such legs are highly sensitive to production tolerances, in the sense that play may develop between the guide members and the outside leg part upon adjustment of the legs in use. This has a negative effect on the stability as far as transverse forces and torsional forces are concerned. Partly due to the current advent of so-called seating/standing furniture, increasingly stringent requirements are made with regard to said stability. The aforesaid great sensitivity is partially caused by the taper in longitudinal direction, in particular of the profiled and bent leg parts, which gen-

erally cannot be avoided in practice, as a result of which play may develop between the second leg part and the guide member upon sliding reciprocating movement of the leg parts with respect to each other. In addition to that, the guide engages exactly at the point where the production tolerances are relatively large, that is, near or on the outside circumference of the leg parts.

[0005] US patent no. US-A-4,981,085 discloses a desk having a top which is adjustable for height by means of two telescopic legs and a rack and pinion mechanism. The telescopic legs comprise an outer leg part comprising two tracks on the inside, which have a flattened V-shaped cross-section. Wheels supported in an inner leg part engage said tracks. Said engagement, and thus the guidance, are lost when the spacing between the tracks becomes larger, for example due to the taper of the outer leg part.

[0006] The object of the invention is to provide a solution for the aforesaid drawbacks. In order to accomplish that objective, the leg is according to the invention characterized in that some clearance is present between the first guide member and the first connecting element, seen in the direction parallel to said flanks. As a result of the use of the two parallel flanks in combination with said clearance, the guiding co-operation between the first guide member and the connecting element is not sensitive to any taper that one of the leg parts, or both, may exhibit. In addition, the dimension between the flanks can be made smaller than the external dimensions of the leg parts. Consequently, also the tolerances that obtain with regard to the connecting element will be smaller, in an absolute sense, than the tolerances on the external dimensions of the leg parts.

[0007] According to one preferred embodiment, the leg is characterized in that one leg part comprises at least one second connecting element having two mutually parallel flanks, which extend parallel to the flanks of the first connecting element, in that the other leg part comprises a second guide member, which engages the two flanks of the second connecting element, and in that some clearance is present between the second guide member and the second connecting element, seen in the direction parallel to the flanks of the second connecting element. The implementation of said aspects leads to a leg whose telescopic action depends even less on the dimensional tolerances of the leg parts.

[0008] A further improvement as regards this aspect is obtained by a leg which is characterized in that one leg part comprises a third connecting element having two mutually parallel flanks, which extend perpendicularly to the flanks of the first and second (if present) connecting element, and in that the other leg part comprises a third guide member, which engages the flanks of the third connecting element, and in that some clearance is present between said third guide member and said third connecting element, seen in the direction of the flanks of the third connecting element.

[0009] A relatively simple, symmetric embodiment of

the leg parts can be obtained in that the flanks of the first connecting element are in line with the flanks of the second connecting element.

[0010] In an advantageous embodiment, at least two of said first, said second and/or said third connecting elements are identical in shape. This, too, has a positive effect on the simplicity of the leg construction.

[0011] It is possible to manufacture the leg parts in a simple manner by realising a form-locked connection between said first, said second and/or said third guide member and a leg part.

[0012] In a very advantageous embodiment, said first, said second and/or said third connecting element is an upright edge on a leg part, which is preferably integral with said leg part. In contrast to a large number of guide member embodiments, such protrusions are eminently suitable for absorbing transverse forces and torsional forces if a suitable material is used for said protrusions.

[0013] The invention furthermore relates to a piece of furniture comprising at least one leg according to the invention.

[0014] Figure 1 is a side elevation of a leg according to the invention.

[0015] Figure 2 is a sectional view of Figure 1, seen along line II-II.

[0016] Figure 3 is a sectional view comparable to Figure 2 of an alternative embodiment of the leg according to the invention.

[0017] Figure 4 is a side elevation of an alternative embodiment of a leg comprising three leg parts according to the invention.

[0018] Figure 5 is a cross-sectional view of the leg of Figure 4, showing said leg in a telescoped position.

[0019] Figure 6 is a cross-sectional view of an alternative leg comprising an open leg part according to the invention.

[0020] The leg that is shown in Figure 1 comprises an inner leg part 1 and an outer leg part 2. In particular in the case of one-legged or two-legged furniture, a base (not shown) may furthermore be fixed to one of the two end faces of the leg. Various guide members 3 are disposed at two positions along the length of the inner leg part between inner leg part 1 and outer leg part 2. Alternatively it is possible for the guide members to extend along a larger part of the length of the inner leg part, for example along 60 or 80 per cent thereof. Slots 4 are formed in inner leg part 1 for fixing the guide members 3. Ribs 5 are disposed on the inside of outer leg part 2 for guiding co-operation with guide members 3.

[0021] The way in which said co-operation takes place is shown more clearly in Figure 2. For a clearer understanding, the left-hand guide member is not shown in the figure. Both leg parts 1 and 2 are substantially rectangular in shape. Ribs 5 having parallel flanks 5a and 5b are present on the inside of the four sides of outer leg part 2. Slots 4 are formed in inner leg part 1, at the location of ribs 5. Openings 6 are formed in the edges of said slots 4. Guide members 3 extend partially

through openings 6. Each guide member 3 has a slotted cavity 8 formed therein. The width and the shape of said cavities have been selected to enable a guiding co-operation, free from play, with the flanks 5a and 5b of ribs 5. The depth of slotted cavity 8 is such that some clearance is still present between the end 5c of ribs 5 and the bottom side 3a of slotted cavity 8. Said clearance of 1 - 2 mm makes it possible to set off some variation in the dimensions of the leg parts. For the same purpose, some clearance has also been left between the outside 3b of guide member 3 and the inside of outer leg part 2.

[0022] In order to enable easy attachment of guide members 3 to inner leg part 1, said guide members 3 have bevelled edges 7, wherein the diameter of the extreme outer circumference is larger than the diameter of holes 6. The bevelled edges 7, in combination with the slotted cavities 8, enable manual, form-locked attachment of the guide members 3 to inner leg part 1.

[0023] Figure 3 shows an alternative embodiment of the guide member, which likewise does not show the left-hand guide member. The shapes of inner leg part 1 and outer leg part 2 correspond to the shapes shown in the preceding figures. Plates 9 are connected to inner leg part 1, in a manner which is not shown, on the inside of inner leg part 1. Two pins 10 are mounted in each plate 9. Said pins 10 extend through openings 12 into inner leg part 1 with some play. Rollers 11 are mounted on said pins, which rollers co-operate guidingly with the flanks of rib 5.

[0024] Figures 4 and 5 show an alternative embodiment of the leg that comprises three leg parts 13, 14, 15. Guide members 16 are attached to leg part 14, whilst leg part 15 has guide members 17 attached thereto. The manner of attachment is similar to that which is shown in Figure 2. Ribs 18, 19 are present on rib part 13 and on rib part 14, respectively. The guiding co-operation between leg parts 13 and 14 on the one hand and leg parts 14 and 15 on the other hand corresponds entirely to the co-operation that has been described with reference to Figures 1 and 2, and consequently it need not be explained in more detail herein.

[0025] Figure 6 shows a telescopic leg comprising a stationary leg part 20 and an open leg part 21. Leg part 20 is supported on the ground, whilst leg part 21 is movable in longitudinal direction with respect to leg part 20. It should be understood thereby that leg part 20 is several times longer than leg part 21. Leg part 20 is provided with three recesses 22 having flanks 22a and 22b so as to enable guiding co-operation between leg part 20 and leg part 21. Open leg part 21 is substantially C-shaped, with an upright edge 23 present in the centre thereof. Guide members 25 are attached, in a manner which is not shown, to the ends of upright edge 23 and of the free longitudinal edges 24 of open leg part 21. Some clearance has been left between the bottom side 26 of recess 22 and the upper side of guide member 25. The same obtains for the upper side 28 of guide member 25 and the bottom side 29 of projecting part 30 of leg part 20.

Guide member 25 extends along 40% of the length of open leg part 21, but alternatively it may also be divided into two spaced-apart parts, in a manner comparable with the situation that is shown in Figure 1. The sides of guide member 25 co-operate guidingly with the flanks 22a, 22b of recess 22.

Claims

1. A leg suitable for a piece of furniture or the like, comprising a first leg part extending along an axis, a second leg part movably along said axis disposed within said first leg part, a first guide member connected to one of said leg parts, and a first connecting element present on the other leg part for guiding co-operation with said first guide member, which connecting element is provided with two parallel flanks, on which the first guide member engages, **characterized in that** some clearance is present between the first guide member and the first connecting element, seen in the direction parallel to said flanks.
2. A leg according to claim 1, **characterized in that** one leg part comprises at least one second connecting element having two mutually parallel flanks, which extend parallel to the flanks of the first connecting element, **in that** the other leg part comprises a second guide member, which engages the two flanks of the second connecting element, and **in that** some clearance is present between the second guide member and the second connecting element, seen in the direction parallel to the flanks of the second connecting element.
3. A leg according to claim 2, **characterized in that** the flanks of the first connecting element are in line with the flanks of the second connecting element.
4. A leg according to any one of the preceding claims, **characterized in that** one leg part comprises a third connecting element having two mutually parallel flanks, which extend perpendicularly to the flanks of the first and second (if present) connecting element, and **in that** the other leg part comprises a third guide member, which engages the flanks of the third connecting element, and **in that** some clearance is present between said third guide member and said third connecting element, seen in the direction of the flanks of the third connecting element.
5. A leg according to claim 2, 3 or 4, **characterized in that** at least two connecting elements are identical in shape.
6. A leg according to any one of the preceding claims, **characterized in that** said first, said second and/or said third connecting element is an upright edge

on a leg part.

7. A leg according to any one of the preceding claims, **characterized in that** said first, said second and/or said third guide member is form-locked to a leg part.
8. A leg according to any one of the preceding claims, **characterized in that** the flanks of said first, said second and/or said third connecting element extend along the entire length of a leg part.
9. A leg according to any one of the preceding claims, **characterized in that** said first, said second and/or said third leg part is an open section comprising two free longitudinal edges, and **in that** said first, said second and/or said third connecting element is formed by one of said free longitudinal edges.
10. A leg according to any one of the preceding claims, **characterized in that** a small clearance is present between said first, said second and/or said third guide member and the leg part comprising the connecting element on which the guide member in question engages in the direction parallel to the flanks.
11. A leg according to any one of the preceding claims, **characterized in that** said leg comprises a third leg part for guiding co-operation with said first or said second leg part.
12. A piece of furniture comprising at least one leg according to any one of the preceding claims.

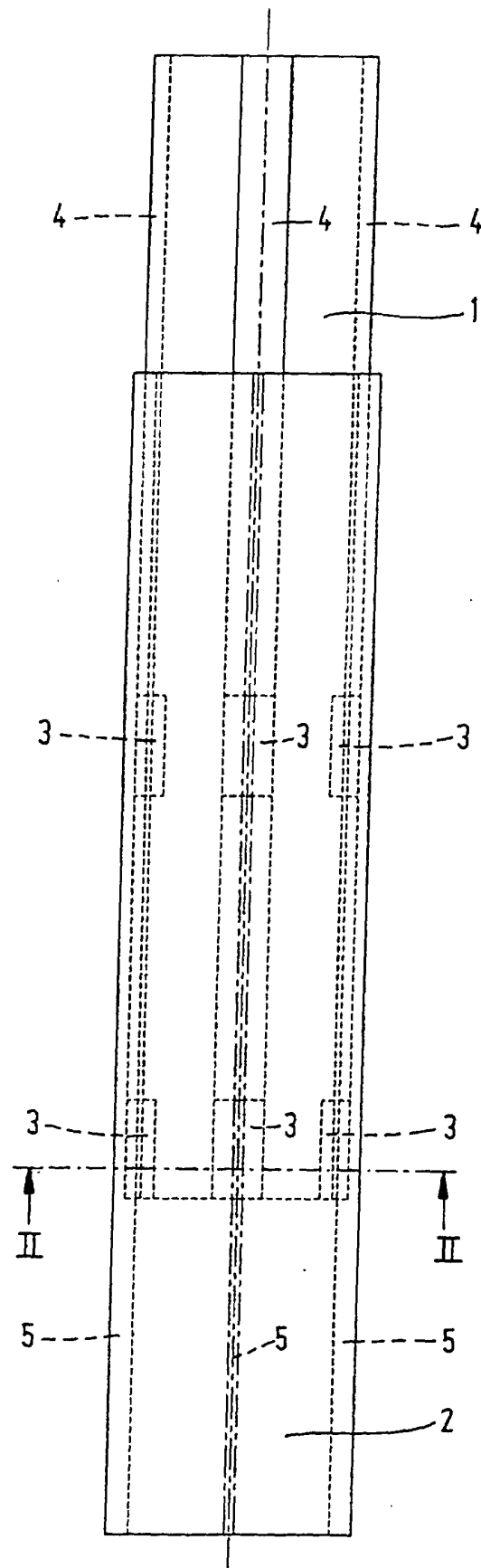


FIG. 1

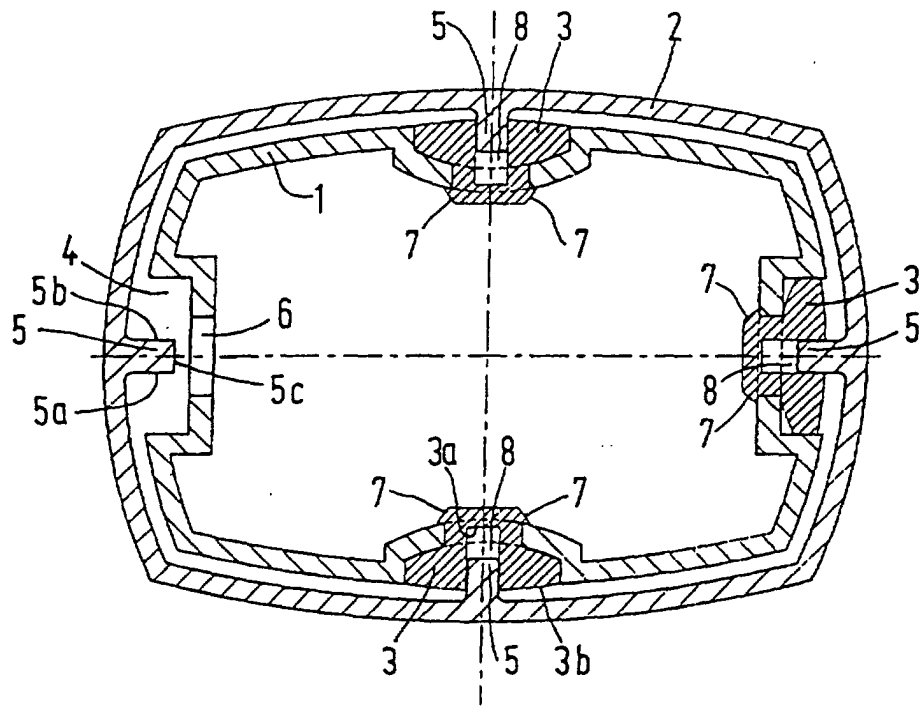


FIG. 2

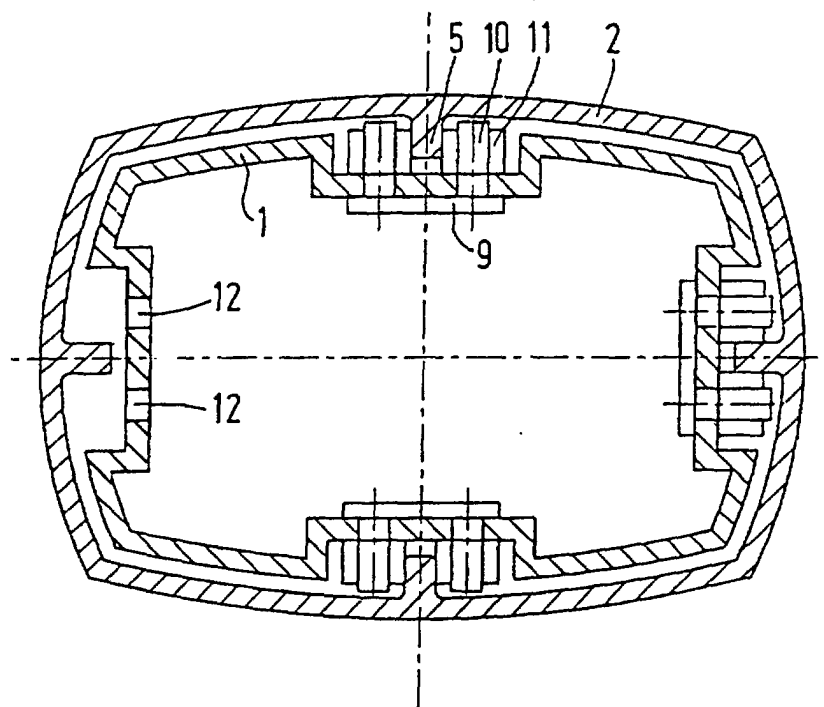


FIG. 3

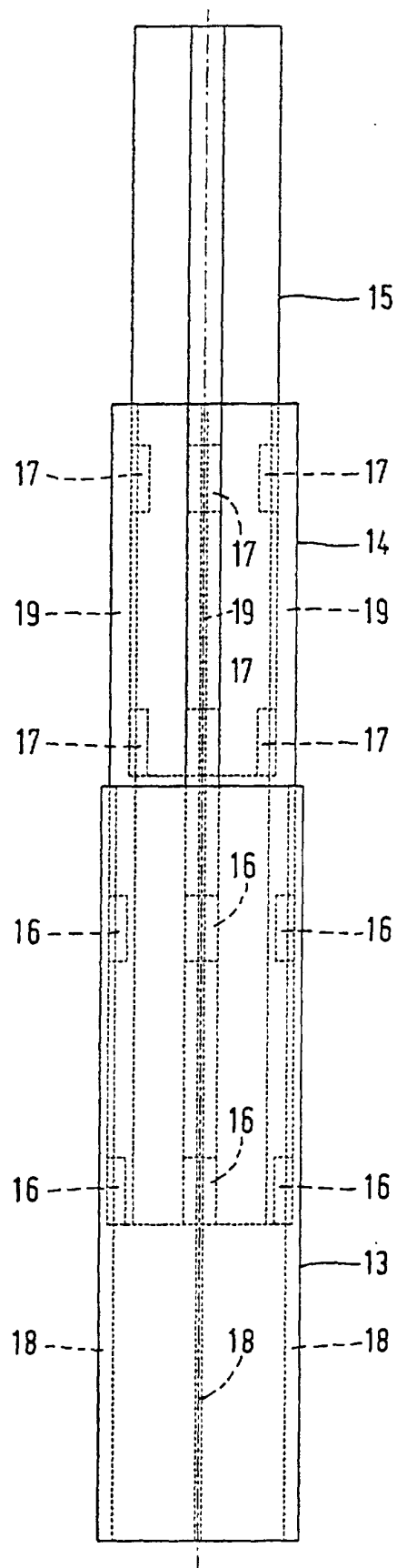


FIG. 4

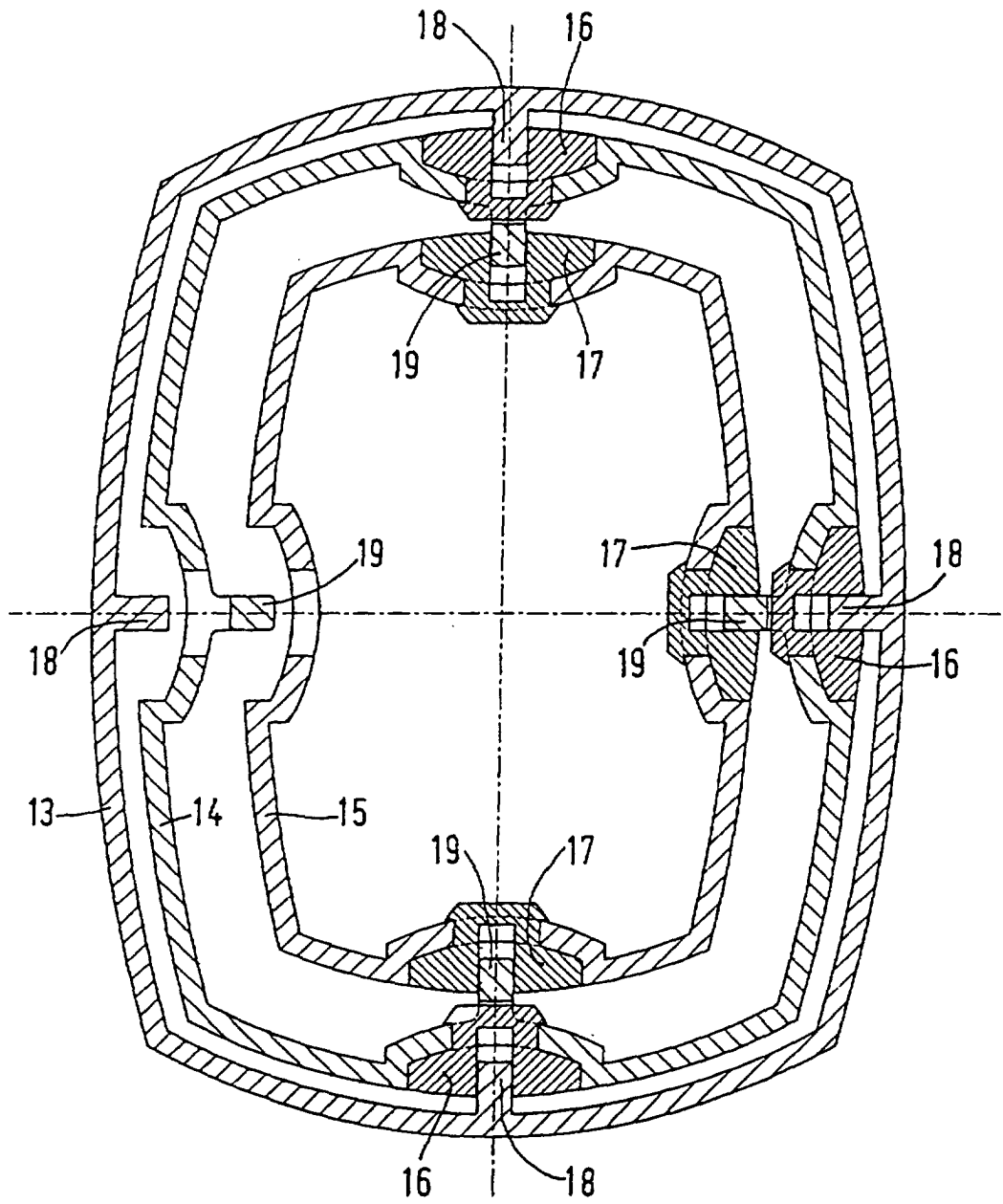


FIG.5

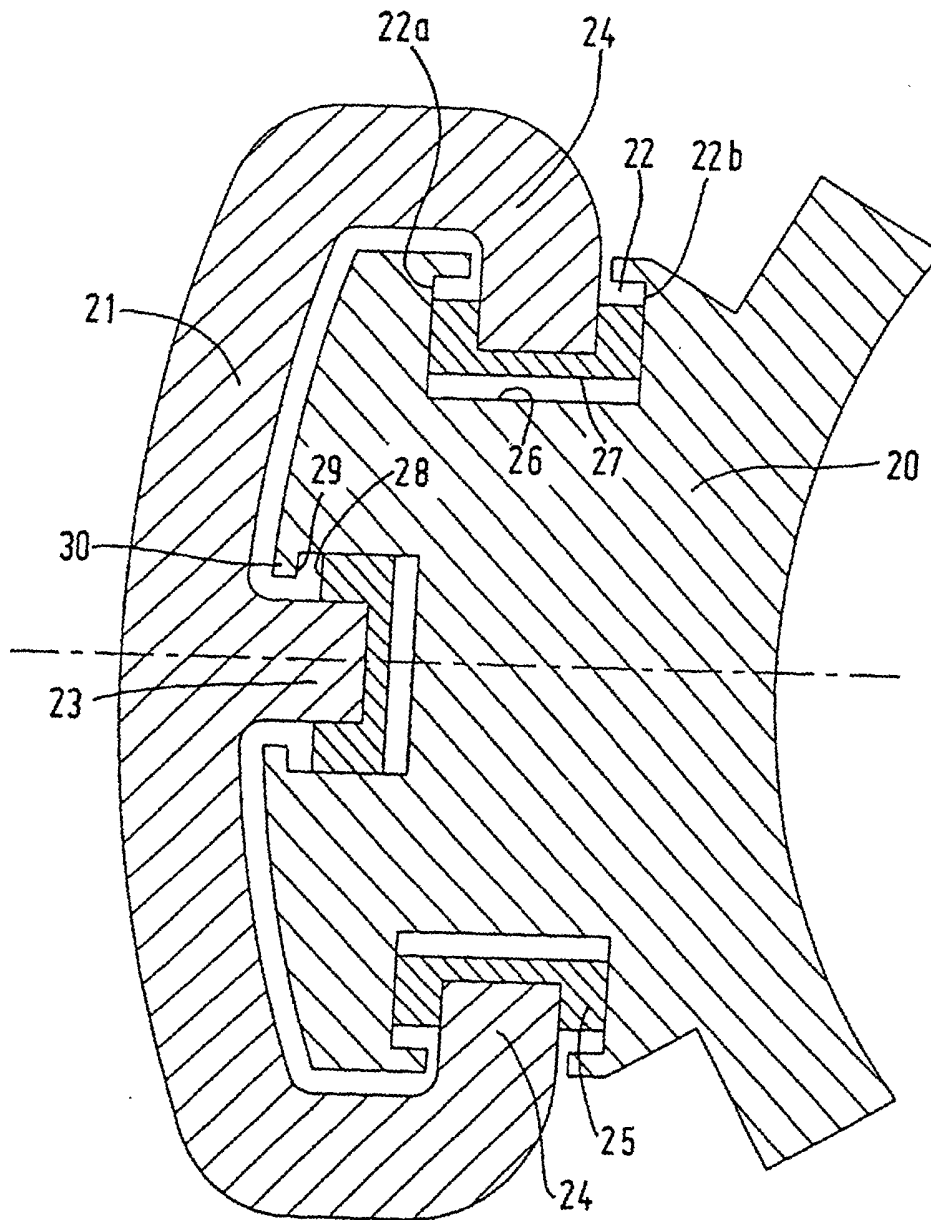


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 2096

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)
D,X	EP 0 681 891 A (OTTO KIND AG) 15 November 1995 (1995-11-15) * abstract * * column 3, line 6 - line 26 * * figure 3 *	1-6,8, 10-12	A47B9/20
Y	---	7	
A	---	9	
Y	DE 295 09 264 U (MIT MODERNE IND TEKNIK APS) 19 September 1996 (1996-09-19) * page 1, paragraph 1 * * page 3, paragraph 2 * * figures 3,4 *	7	
A	---	1-6,8-12	
A	EP 0 790 420 A (AVS DANMARK A S) 20 August 1997 (1997-08-20) * figures *	1-12	
A	DE 298 12 762 U (PHOENIX MECANO KOMPONENTEN AG) 17 September 1998 (1998-09-17) * abstract; figures *	1-12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) A47B A47C F16B F16M F16C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 August 2001	Examiner Ottesen, R
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EPO FORM 1503 03/92 (P04C01)

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

EP 01 20 2096

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22-08-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0681891	A	15-11-1995	DE 9406396 U	11-08-1994
DE 29509264	U	19-09-1996	NONE	
EP 0790420	A	20-08-1997	DE 19605953 A	21-08-1997
			DE 59701829 D	13-07-2000
			DK 790420 T	23-10-2000
DE 29812762	U	17-09-1998	NONE	

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