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### (54) **An elastic weaved belt to sustain the human body**

(57) The invention relates to a woven elastic belt, destined to support the human body in indoor and outdoor articles of furniture, seats for motor vehicles or the like, of the type comprising a plurality of elastic threads covered with substantially anelastic threads, which together

form the warp of the belt, woven with substantially anelastic weft threads. With the object to improve the operating conditions, at least some of the elastic threads are polyurethane threads.

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## Description

**[0001]** The present invention relates to woven elastic belts used to support the human body in applications for articles of indoor or outdoor furniture, such as chairs, seats, settees, beds or other similar items, as well as for seats of motor vehicles and similar applications. These belts are placed in tension between opposite sides of a frame of the article of furniture or the like and support, as stated, the weight and the thrust of the human body in place of more traditional springs.

**[0002]** Every belt is obtained from webbing with elastic warp threads in tension and substantially anelastic weft threads.

**[0003]** Every warp thread is in fact formed from a rubber thread, either natural latex or synthetic rubber, that it is covered with a substantially anelastic thread, for example a polypropylene thread. The covering can be carried out by various methodologies, in themselves known, called respectively "chain stitch", "monospiral" or "bispiral". In particular, the chain stitch covering forms a plurality of knots, substantially equidistant, that limit the maximum elastic excursion of the complex formed by the elastic thread and the substantially anelastic covering thread. For example, the distance between two consecutive knots on the rubber thread, in conditions of maximum traction, is usually comprised between some tenths of a millimeter and some millimeters.

**[0004]** These elastic belts have found very many applications in the fields cited, but however it has also been found that they can have some disadvantages, both in relation to particular uses, and in relation to their durability and the retention of their characteristics over time

**[0005]** In effect, the elastic belts with rubber threads have, exactly due to such rubber threads, an insufficient resistance to heat, ozone and to chemical agents in general. They tend to age and the rubber threads, with use, tend to tear and break, especially as a result of the tightening action exerted on them by the knots or the threads of the covering.

**[0006]** The object of the present invention is to propose an elastic belt of the type used for the cited applications which, while maintaining at least the same performance as the current elastic belts, avoids the disadvantages cited above.

**[0007]** This object is achieved, according to the invention, by replacing one or more of the rubber threads - preferably all the rubber threads - each with a thread or bundle of two or more polyurethane threads, especially threads in spandex.

**[0008]** These threads or bundles of threads in spandex remain unaltered under all conditions in which rubber threads degrade, and the spandex threads are not in danger of breaking or being cut by the knots or the threads of the covering. Considering that the threads of spandex that are commercially available are in general thinner than the rubber threads necessarily employed in the belts cited, it can be suitable to replace every rubber thread

with a bundle of two or more threads in spandex, up to an overall value of 1000 to 11000 dtex.

**[0009]** Moreover, the covering can be advantageously carried out with a covering having chain stitch knots that are closer to each other than those used in the covering on the rubber threads (up to + 80%) and this without danger of ruining the spandex threads. For example, the knots of the covering applied on the spandex are located with a gap thereof, under conditions of maximum traction, comprised between 1 mm and 9 mm.

**[0010]** The covered spandex threads are then arranged as the warp for the webbing of the belt according to classic methods. The warp can also be placed under tension in this case, but it is possible in this way to exercise a tension close to the maximum that can be applied to the covered elastic threads of spandex, unlike what happens in the case of the rubber threads, where the tension must be limited in order not to excessively wear out the rubber.

**[0011]** Under these conditions, the spandex works better than the rubber, which shows the maximum wears under tension.

## Claims

1. A woven elastic belt, destined to support the human body in indoor and outdoor articles of furniture, seats for motor vehicles or the like, of the type comprising a plurality of elastic threads covered by substantially anelastic threads, which forms the warp of the belt woven with substantially anelastic weft threads, **characterized in that** at least some of the elastic threads are in the form of polyurethane threads.

2. An elastic belt according to Claim 1, **characterized in that** the elastic threads are of spandex.

3. An elastic belt according to Claim 1 or 2, **characterized in that** the elastic threads are each formed by one, two or more polyurethane threads bundled and covered with a single substantially anelastic thread.

4. An elastic belt according to Claim 3, **characterized in that** every thread or group of threads covered together by a single substantially anelastic thread, has a total value of 1000 to 11000 dtex.

5. An elastic belt according to one or more of the previous Claims, **characterized in that** every elastic thread or every group of elastic threads is covered with a substantially anelastic thread applied as a "monospiral" or "bispiral" chain stitch.

55 6. An elastic belt according to Claim 5, in which every elastic thread or every group of elastic threads is covered with a substantially anelastic thread applied as a chain stitch, **characterized in that** the knots of

the covering chain stitch are located at a mutual distance of between 1 mm and 9 mm under conditions of maximum tension.

7. An elastic belt according to any of the previous Claims, **characterized in that** it is woven with the warp threads stretched close of the their maximum allowed tension. 5

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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 63 203113 A (INOUE YUTARO; INOE JUTARO) 23 August 1988 (1988-08-23) * figures 1-3 * -& DATABASE WPI Week 198839 Derwent Publications Ltd., London, GB; AN 1988-275757 XP002399994 & JP 63 203113 A (INOUE Y) 23 August 1988 (1988-08-23) * abstract * -----	1-4,7	INV. D03D15/08
X	US 4 215 684 A (WESTIP, WILHELM) 5 August 1980 (1980-08-05) * column 1, line 5 - column 4, line 3; figure 1 *	1-3,5	
X	US 5 069 957 A (VANDERMEERSCH ET AL) 3 December 1991 (1991-12-03) * column 2, line 67 - column 4, line 52; figures 1-3 *	1-5	
X	DE 78 33 419 U1 (KARL OTTO BRAUN KG, 6759 WOLFSTEIN) 15 February 1979 (1979-02-15) * page 5, line 8 - page 9; figures 1-3 *	1-4	TECHNICAL FIELDS SEARCHED (IPC)
A	US 2 706 898 A (GROSS IRVING ET AL) 26 April 1955 (1955-04-26) * column 1, line 54 - column 65; figures 1-14 *	1,3,5,6	D03D A47C B60N D04B
The present search report has been drawn up for all claims			
4	Place of search	Date of completion of the search	Examiner
EPO FORM 1503 03/82 (P04C01)	The Hague	22 September 2006	Kus, Slawomir
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			

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

EP 06 01 2083

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. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-09-2006

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
JP 63203113	A	23-08-1988	JP	1798682 C	12-11-1993
			JP	5005486 B	22-01-1993
US 4215684	A	05-08-1980	AT	365068 B	10-12-1981
			AT	667578 A	15-05-1981
			DE	2741826 A1	29-03-1979
			DK	409178 A	17-03-1979
			EP	0001256 A1	04-04-1979
			ES	238132 Y	16-05-1979
			IT	1157183 B	11-02-1987
			PT	68563 A	01-10-1978
US 5069957	A	03-12-1991	CA	2027926 A1	23-06-1991
			EP	0434473 A1	26-06-1991
			FR	2656339 A1	28-06-1991
DE 7833419	U1	15-02-1979	NONE		
US 2706898	A	26-04-1955	NONE		