



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A REVIEW ON SEAT BELT WEBBING

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Abstract: Seat belts or safety belts are important for automobile vehicles. The webbing plays an important role in the properties of the seat belts. The structure and type of fabric improves the performance of the seat belts. The various seat belts, the seat belts with energy storing properties, seat belts with load sensitive properties, seat belts with printed face and back and woven seat belts are available. In this review, the production of the above seat belts are described.

Index Terms - Seat belt, webbing, non woven, woven, braiding, safety, performance, production.

I. INTRODUCTION

Seat belt systems also called as safety belts have emerged significantly as these systems have become important equipment in all different types of cars and other automobiles, and as many types of seatbelts have been provided for active and passive systems [1]. A woven seatbelt webbing is provided which has all of the important characteristics. The good stiffness and resilience along the width of the webbing, is enough to avoid roping conditions, folding of the webbing, that could finish in manufacturing of the seatbelt system is achieved by giving both monofilament and multifilament filling yarns. The usage of inflatable devices to many uses is similar in many fields. They are used in construction of various types, particularly as brace structures which are used by inflation with compressed air, or high-pressure fluid. A webbing helpful for seat belts having a good impact energy absorption and a high impact strength, consists a webbing made by weaving warps and wefts. It is the webbing to be used for seat belts for automobiles is to have a good absorption or mitigation of the impact force given to a human body by collision, and a good light weight, durability, colour, pattern, design, and shape. It is, however, difficult to give a webbing for seat belts having such a good impact force-absorption or mitigation property [2].

Production of Seat Belts Webbing

A procedure for producing safety belt webbing is given in which the webbing is first woven by two synthetic yarns of variant colours of which one yarn is spun dyed, and that is differentiated in that the webbing is then given to experiment in a water having at least one disperse dye. Safety belt webbing should undergo stringent requirements in order to usage, place of application and strength. In extra to meet strict characteristics for abrasion resistance, resistance to light and heat. Safety belt webbing should be available of being in place and erased, and should always rest protectively and lustre on the customer during use. Well retraction behaviour of the safety belt webbing is important for these last behaviours. In extra to a well-adjusted retraction mechanism specifically tailored to the specific application, the material properties of the webbing are always important here. Of these material characteristics, the layer of the webbing is some significance because its structure and properties mainly affect the retraction behaviour. So many tests have been made to affect the surface characteristics of safety belt webbing in order to retraction behaviour. Especially in this respect is the thermalizing process, in which, the weaving process, the yarns are treated to hot- air treatment, results in a smoother surface of the webbing thus treated and to increase retraction behaviour. The usage of spun-dyed and undyed synthetic yarns for safety belt webbing, in addition with weaving methods that are known with the process of experiment in a 15 water-bath having disperse dyes, resulting in different colour sequences, hues and patterns being visible [3].

Energy Absorbing Seat Belt Webbing

Energy absorbing safety belt restraint consisting a thin, flexible long element with a length sufficiently larger than its width and suitable for a wearer in a car, the tool being given with one integral noncontinuity along its length, then the element is suitable of absorbing kinetic energy released there to by actions of the customer. It has identified that by giving only one noncontinuity in the safety belt tool, the energy absorbing capacity of the element is rapidly increased [4]. Such noncontinuity can be in different forms, such as slits, perforations or other structures provided in seat belt webbing, and shown at the edges or in the central parts of the webbing. The noncontinuities may long in longitudinal, transverse or angular directions, or combinations, and will be shown in the element itself or will be formed in a similar element which is similar to the restraining element in the order of a patch, for example. Many important information of the present invention is discussed. A flexible safety belt restraint tool, probably in the form of conventional seat belt webbing, is given with only one integral noncontinuity with its length so as to give a kinetic energy absorbing structure. The restraint element of this invention should be used in any type of safety belt system. Probably, the 20-energy absorbing characters is given on a shoulder since that part of a passenger restraint system usually is down the most stress in a collision. Otherwise, the energy absorber should be given in the lap belt or in both the lap and shoulder belts [5], [6].

Load Sensitive Belt

A load sensitive belt, where the ground threads are interchanged by shorter threads of different load capacity. In all studies the load capacities and extensibility are lower than of the ground threads [7]. It is one of the principal objectives of the new invention to give a load sensitive belt to show the amount of stress in it. Another objective of the new invention is to give a load sensitive belt in which some of the ground threads are interchanged by colour coated threads of lower load capacity [8]. In order to the new device, many quality threads are given when weaving a web for a seat belt, and then web is coloured. The single thread is of the type which is either uncoloured or, if dyed, gives a colour different and easily differentiable from the colour of the ground thread portion, and such single threads are given at repeated gaps along the web so that they are seen on the web surface. Also, the single threads have low inherent extensibility and are lesser in woven length than the ground thread, so they will be taken when subject to some level of load. The amount of load is lower than the load level at which the ground thread is taken, thus testing of the performance or capability of the load given out safety belt according to which of the separate threads shear. A load sensitive belt consists an long web including longitudinally extending ground warps and indicator warps and given in that indicator warps are at least less seen along a face of web and has a lesser bursting elongation than ground warps and are of many colour than and seen differentiable from ground warps at face of web by indicator warps bursting on a load over a undetermined value being given to belt lower than the value of the bursting load of belt and the bursting of indicator warps are visible at a face of web [9], [10].

Seatbelt with Printed Face

An objective of the new invention is to give a Safety belt that is able of importantly having an good show of a product and well performing by forming a printed face at the other Side of a safety belt on which a behaviour, a mark or a pattern is appears in more to its common Simple function, able of facilitating on and removing the safety belt by avoiding drivers hands from going out when he or she wears safety belt with a printed face on the safety belt as well as looking the common function of the safety belt, and is able of monitoring a durability of the printed face without a situation that permeability and adhesive Strength of a printed ink of the safety belt is low and detached and its printing method. Many other objectives of the new invention are to give a polyester safety belt with printed Surface on which a behaviour, a spot or a structure is solidly appeared, the printed Surface is monitored durably without disconnected, and its printing method. Other objectives of the new invention are to give a Safety belt with a printed face of which a moulding part and a part which will not process moulding are important in case that a wanted printed face is moulded on a safety belt, and its printing method. Particularly, the print for the safety belt of the new invention consists of liquid phase Silicon rubber, a plastic Sol or span Sol and Sol ink. Since, a silk printing and decalcomania should be taken as a print member in the new invention, and as a print member for the safety belt, a radio frequency, a razor printing and jacquard method are takes place [11].

Woven Band for Seat Belts

A woven band mainly used in safety belts for drivers of automobiles. The band is given with warp yarns with variant comparative elongation behaviour, and weft yarns in re woven with warp yarns. The warp yarns with low comparative elongation is interwoven between other of the warp yarns having high elongation and strength to form the band layer only one differentiable same strip, with the ratio between the comparative elongation of the yarns of the strip to the elongation of the rest of the warp yarns are less than the ratio of the main tensile force of the band to the original breaking force. The invention can be used to the main uses in safety belts for drivers and passengers of automobiles. It is also useful, as a load-bearing known in loading 10 operation, in which is of main importance to regulate the causes of overloads which can followingly takeover to the breadding of a load-carrying. Therefore, the band for safety belt will bare 20 only, since a limited tensile force which gains the maximum amount of the kinetic energy affected by a motor accident. Any uncertain load across the band's width show in that overloads and under loads are strongly fall at the middle and edge parts of the band. The order of indicator strips at the spacing from the band's edges gives a maximum accuracy of the indicator's process [12], [13].

Ergonomic Safety Belts for Improved Belt Safety and Comfort

A well-developed ergonomic safety belt and process of creating a safety belt is given that runs as protective and more comfortable safety belt by avoiding the rough edges of safety belts that are to affect tenderness by friction and made into a safety belt driver while a high-speed accident [14]. The creators have identified a necessity for an ergonomic safety belt and process of making an ergonomic safety belt for advanced protective and luster will reduce or erase the known defects. It could be better to give a safety belt which gives luster to drivers of different sizes and is able of long use without the need of many components, hence minimizing cost and rectifying the manufacturing flow of the safety belt. An ergonomic safety belt and process of making a safety belt in order with the new invention are better as contrasted to subsiding safety belts and process of forming seat belts. First, the initial safety belt and process of forming a safety belt gives a tool which runs as protective and more comfortable safety belt, both as a lap strap or shoulder Strap, for drivers of different sizes. The create on gives other process of making a safety belt for giving advanced luster and protection to driver of the safety belt. Another method also includes giving an initial and second thin sheet along a longitudinal axis and second longitudinal stops on opposite sides of longitudinal axis. The initial and second thin sheets could contain woven vinyl [15].

Conclusion

Nowadays, seat belt is mandatory for automobile vehicles and saves the life. So the property is important for seat belts. So many methods are used to improve the performance of the seat belts. The seat belt webbing is important for the performance of the seat belt. Various methods and fibres are used to improve the webbing performance. In this review, the production of seat belt with various types of webbing is explained.

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