DOWNLOAD PDF MECHANICAL MOVEMENTS, POWERS, DEVICES, AND APPLIANCES: COMPRISING AN ILLUSTRATED DESCRIPTION OF .

Chapter 1 : KnowledgePublications - Learning a Little More Every Day

This item: Mechanical movements, powers, devices, and appliances, comprising illustrated description of mechanical movements and devices used in constructive and a mechanical dictionary, commencing with.

A built-in domestic appliance comprising: The built-in domestic appliance as claimed in claim 10, wherein the sensor device includes a pressure sensor device for generating a trigger signal which indicates the presence of the foreign body when the pressure exerted particularly by the foreign body on the pressure sensor device exceeds a predetermined pressure threshold value. The built-in domestic appliance as claimed in claim 11, wherein the pressure sensor device includes a mechanical pressure sensor having a force transmission element which projects at least in places into the gap and is mounted movably on or in the door in order to generate the mechanical trigger signal in the form of a-movement of the force transmission element in response to a force effect on the force transmission element brought about by the foreign body in the gap. The built-in domestic appliance as claimed in claim 11, wherein the pressure sensor device includes an electrical pressure sensor device for generating an electrical trigger signal. The built-in domestic appliance as claimed in claim 10, wherein the sensor device is implemented as a camera device or motion detector in order to generate the electrical trigger signal in response to the presence of the foreign body in the gap. The built-in domestic appliance as claimed in claim 11, further comprising transmission facility for transmitting the trigger signal to the blocking device. The built-in domestic appliance as claimed in claim 10, wherein the hinge device has a plurality of movable hinge elements which interact in a suitable manner in order to implement the desired opening and closing movement of the door. The built-in domestic appliance as claimed in claim 16, wherein the blocking device is implemented in order to limit the relative movement of one of the hinge elements with respect to another of the hinge elements or to the door or to one of the furniture bodies by means of a direct or indirect action such that a movement of the door is either no longer possible or is only possible in a direction which would result in an enlargement of the gap. The built-in domestic appliance as claimed in claim 17, further comprising an auxiliary control facility provided between the blocking device and at least one of the hinge elements for the indirect control of the hinge element by the blocking device. The built-in domestic appliance as claimed in claim 10, wherein the built-in domestic appliance includes a refrigerating apparatus. A method for operating a built-in domestic appliance comprising hinges for hinging a door to the furniture body of the built-in domestic appliance, comprising the following acts: The invention relates to a built-in domestic appliance, particularly a built-in refrigerating apparatus which comprises hinges for hinging a door to the furniture body of the built-in domestic appliance. In addition, the invention relates to a method for operating the built-in domestic appliance. Such types of built-in domestic appliances having hinges are basically known according to the prior art. They are typically designed such that they implement a predefined opening and closing movement of the door relative to the furniture body. Particularly in the case of built-in domestic appliances for the US American market a gap forms between an in particular vertical edge of the door of the first furniture body and the front of a second furniture body adjacent to the first furniture body. In the USA in particular, this potential for danger is associated with the risk of considerable claims for compensation for damages against the manufacturer of the built-in domestic appliance. With regard to a quite similar problem, namely the danger of injury and in particular crushing of the limbs of a user of a built-in domestic appliance in the event of accidental encroachment into a hinge, a solution is known on the basis of the prior art, which is disclosed in the publication DE 44 18 A1. According to this publication, a cover which preferably isolates the hinge from any user encroachment during all possible pivoting movements is provided in the case of a multi-jointed hinge. This cover has an elastic plate element in the form of an elastic tongue which extends in the direction of the length of a gap between the door and the body of the built-in kitchen appliance, in other words typically in the vertical direction, but whose length or height is restricted to the height of the hinge. The object of the invention is to use simple design measures to reduce the risk of injury, particularly of crushing, which is caused by an unavoidable gap between one edge of the door of the first furniture body and for example the front of a second furniture body adjacent to the first furniture body. This object is achieved by the subject matter of the claims. The built-in domestic appliance described by this subject matter is characterized by a sensor device for monitoring the gap for foreign bodies and a blocking device for blocking the hinge device when the sensor device detects the presence of a foreign body in a direction of movement of the door which would result in a further reduction in the gap. The claimed embodiment of the built-in domestic appliance having a sensor device in particular enables the detection of a foreign body for example in the form of limbs of a user of the furniture body or of the built-in domestic appliance in the gap. In addition, the claimed embodiment makes it possible to introduce suitable countermeasures in order to prevent or counteract any crushing of limbs. Such countermeasures are implemented with the aid of the claimed blocking device which either completely blocks the hinge device when the presence of a foreign body is detected, such that no further movement of the hinge and of the door attached to it is possible, or that only a movement of the door which would result in an enlargement of the gap is possible. In the latter case in particular the trapped foreign body can then be easily removed again from the gap. The claimed invention contributes not only significantly to reducing the risk of injury to the user but also advantageously significantly to a reduction in the risk of liability for the supplier or manufacturer of the furniture bodies or of the built-in domestic appliances. Both electrical and also mechanical pressure sensor devices, which react to a force effect exerted on them by the foreign body in the gap and detect the foreign body in this manner, are advantageously suitable for use as sensor devices. As an alternative or in addition to being implemented as a pressure sensor device, the sensor device can also be implemented as a camera device or as a motion detector for optical detection of the foreign body in the gap. It can furthermore be advantageous if the blocking device acts not directly but indirectly by way of an auxiliary control facility on the hinge device and in particular its hinge elements. Further advantageous embodiments of the hinge are set down in the subclaims. The aforementioned object of the invention is furthermore achieved by a method for operating a built-in domestic appliance which comprises hinges for hinging a door to a furniture body. The advantages of this solution correspond to the advantages stated above with reference to the claimed built-in domestic appliance. The invention is accompanied by a total of three figures. The invention will be described in detail in the following with reference to the aforementioned figures. The same elements are identified by the same reference characters in all the figures. It comprises a hinge device for hinging a door to the furniture body of the built-in domestic appliance implemented as a built-in refrigerating apparatus, of which only one side wall is drawn hatched in FIG. The hinge device comprises a plurality of hinge elements With regard to this opening and closing movement, indicated by means of a double-headed arrow drawn in FIG. This gap S holds a risk of injury inasmuch as foreign bodies, particularly limbs of a user of the furniture body or of the built-in domestic appliance, can become trapped or crushed in the gap when there is a movement of the door On account of the risk of injury described, particularly in the USA the gap also holds a considerable risk of product liability and compensation for damages. In order to avoid the risks described, the hinge according to the invention additionally comprises a sensor device for monitoring the gap S for the foreign body see FIG. The blocking device acts, as described, either directly or indirectly by way of an auxiliary control facility , in FIG. The sensor device monitors, as stated, the gap S for a foreign body In response to the presence of the foreign body the sensor device generates a trigger signal in order to trigger a blocking of the hinge device by the blocking device The trigger signal can be implemented in electrical or mechanical form, according to the implementation of the sensor device A mechanically implemented trigger signal can for example be represented by the motion of a body. Depending on local circumstances and the implementation of the hinge in use with the built-in domestic appliance it can be advantageous if the trigger signal is transmitted not directly but by way of an electrical or mechanical transmission facility to the blocking device In the case of an electrical signal, the transmission facility can for example be implemented in the form of an amplifier or relay and in the case of a mechanical trigger signal in the form of a bar or gearing. Analogously, it can be advantageous depending on the installation situation and implementation of the hinge device if the blocking device acts not directly but indirectly by way of the auxiliary control facility on the hinge device or its elements The blocking device is designed according to the invention such that it prevents any injury to the foreign body , in other words particularly the trapping of limbs, in the gap S. Specifically, the blocking device guarantees this by either completely blocking the movement of the hinge device and thereby of the door hinged to it or by only permitting a movement of the hinge device in such a direction as would result in an enlargement of the gap S and thereby a release of any trapped foreign body. In this case the sensor device consists of a force transmission element which is formed for example as a bendable plate element. This force transmission element is for example mounted so it can slide in the door with the aid of a guiding device It extends perpendicular to the drawing plane preferably over the entire length or height of the gap S and projects with one end into the latter. At its other end it has a non-positive coupling with the transmission facility or a direct coupling with the blocking device When the foreign body is present in the gap S, in the event of a pivot movement of the door in the arrow direction P it exerts a force on the end of the force transmission element projecting to the gap S. This force is then preferably transmitted as a mechanical trigger signal, as already indicated above, either to the transmission facility or directly to the blocking device The blocking device would then stop or reverse the movement of the door in the arrow direction P in this case. As soon as the force acting on the force transmission element decreases, whether it be either because the foreign body has been removed from the gap or because the pivot movement of the door has been reversed, the force transmission element is advantageously returned to its home position for example by means of a return spring , such that it once again projects into the gap S as a sensor if need be.

Chapter 2 : Knee joint and method - Becker Orthopedic Appliance Company

Mechanical movements, powers, devices, and appliances: comprising an illustrated description of mechanical movements and devices used in constructive machinery and the mechanical arts.

Claims What is claimed is: An orthodontic locking device for use with an arch wire having uniform surfaces, said device comprising means defining a passage for the insertion of the arch wire and means defining a tension spring for bearing against the arch wire the tension spring being oriented relative to the arch wire at an angle of less than An orthodontic device according to claim 1, further comprising a member having a channel defined through it, the channel being of larger cross section than the cross section of the arch wire thereby to permit free movement of the arch wire in the channel and the member being of smaller cross section than the passage in the device thereby to permit insertion of the member into the device, the spring bearing against the member instead of against the arch wire when the member is inserted in the device. An orthodontic device according to claim 1 in combination with a buccal tube, the device being located mesially of the buccal tube. An orthodontic device according to claim 1 in combination with a buccal tube, the device being located distally of the buccal tube. An orthodontic device according to claim 1 in combination with a buccal tube, the device being integrated with the buccal tube. An orthodontic device according to claim 1 in combination with an orthodontic bracket, the device being located mesially of the bracket. An orthodontic device according to claim 1 in combination with an orthodontic bracket, the device being located distally of the bracket. An orthodontic device according to claim 1 in combination with an orthodontic bracket, the device being integrated with the bracket. Orthodontics is, unfortunately, to a significant degree characterized by unintentional inflicting of discomfort upon the patient. The bending and cinching of arch wires result in projections which frequently act as irritants. For example, regarding the conventional buccal tubes which are used to anchor the ends of arch wires, a free end of an arch wire after being inserted through a buccal tube is locked relative to the buccal tube by cinching or bending. Buccal tubes are mounted on molars and orthodontic brackets are mounted on molars or other teeth by means of orthodontic bands or adhesive bonding. An orthodontic bracket serves to guide and position an arch wire relative to the tooth in which the orthodontic bracket is mounted and to help transmit forces from the arch wire to that tooth. This amounts to additional work for the orthodontist and the creation of additional potential irritants in the mouth of the patient. On the other hand, prior art lockable orthodontic brackets are difficult to manipulate. The buccal tubes of FIG. This buccal tube, however, is constructed very much differently from the devices of the present invention and, moreover, unlike the devices of the present invention is not disclosed for use also in conjunction with an orthodontic bracket. It appears that when this device is used as a buccal tube, it may not be necessary to extend the wire so far that it projects out of the buccal tube. The construction of this device is, however, very much different from the devices of the present invention. The clamping mechanism, however, is entirely different from the present invention. This patent is of interest only in connection with a feature of the present invention in which there is provided a slip tube for insertion in a device of the invention to permit the device to float freely on an arch wire. However, the inserts of the aforementioned patent are, in principle, entirely distinct from a slip tube of the present invention. This buccal tube has a clamping feature which is distinctly mechanically different from the manner of locking of a device of the present invention. In the aforementioned patent, the locking member is a wedge or a threaded element adapted to be received in the body of the buccal tube to bear against the arch wire end. The orthodontic spring clip fastening system of U. However, in construction, it is quite distinct from a device of the present invention. There is, however, no essential structural similarity to a device of the present invention. A device of the present invention, however, is not a rack and dog arrangement and permits infinite adjustment rather than mere stepwise adjustment, as well as free floating of the wire if desired. It is an object of the invention to provide novel orthodontic devices to be used with an "edgewise" or "light wire" technique and which eliminate the disadvantages characteristic of the prior art. It is a further, more specific object of the invention to provide novel orthodontic devices which are releasably lockable relative to arch wires and which move in one direction relative to the arch wire and lock in the other direction. Other objects and advantages of the present invention will be apparent from the following description thereof. A device of the invention can be used on any or all individual teeth, being mounted on teeth, like other orthodontic devices, by conventional means, namely orthodontic bands or adhesive bonding. A device of the invention can be placed on the distal end of an arch wire after the wire is passed through a conventional orthodontic tube. Apart from being used with an orthodontic tube, such as a buccal tube, a device of the invention can be integrated with a conventional orthodontic tube. A device of the invention can be integrated with a conventional orthodontic bracket or used in place of a conventional orthodontic bracket or it can be attached mesially or distally to the bracket. Devices of the invention are releasably lockable relative to arch wires. The device permits relative movement of the arch wire and the device in one direction only. This makes bending or cinching of the arch wire ends unnecessary. Also, the device may serve as a novel stop for tying segments of teeth together or preventing undesirable individual tooth or segment movement. Simple use of a conventional dental tool, such as a probe, unlocks the device. An additional device, which may conveniently be referred to as "slip tube," is provided according to the invention to hold open the lockable device of the invention so that the lockable device and arch wire can slide relative to each other freely in both directions. Structurally, an orthodontic device according to the invention comprises means defining a passage for an arch wire and means defining a tension spring for bearing against the arch wire. The tension spring has a free end portion for bearing against the arch wire and is fixed at its other end relative to the rest of the device. The tension spring locks against the arch wire to prevent relative movement of the arch wire and the device toward the other end of the spring and yields to the arch wire to permit relative movement of the arch wire and the device toward the free end of the spring. The device may be used in combination with a conventional buccal tube or orthodontic bracket, being located mesially or distally thereof or integrated with the buccal tube or orthodontic bracket. The aforementioned additional device or "slip tube" may comprise a member having a channel defined through it. The channel is of larger cross section than the cross section of the arch wire to permit free movement of the arch wire in the channel. The member is of smaller cross section than the passage in the locking device to permit insertion of the member into the locking device. The spring bears against the member instead of against the arch wire when the member is inserted in the locking device. Use of the devices of the invention makes unnecessary cinching back or tying back arches. Arches can be activated by pushing them through locking devices of the invention and released for removal without distortion or mutilation. The discomfort caused by the cinching process is avoided. No wire has to extend out of the posterior part of a buccal tube, eliminating a major source of patient discomfort. Use of the devices of the invention permits the use of arches of very high grade alloy wires which would not generally be used if multilation occurred upon removal or activation of the arch. The devices of the invention are also ideally suited for non-metallic wires which would otherwise require exotic techniques for cinching or activation within the oral cavity. A further application of devices of the invention is the use thereof on teeth other than the tooth most posterior on the appliance in order to utilize functional force orthodontic tooth movement. Teeth rock during chewing and this may be referred to as movement of the teeth due to the application thereto of functional forces. Normally the net effect of this movement on the relative positions of the teeth is essentially zero. It can readily be appreciated, however, that since a locking device of the invention permits relative motion of the arch wire and the locking device only in one direction, if a tooth to which such a locking device is attached happens to rock in the direction in which the device will move on the wire, the device will prevent the tooth from returning to its original position and, very slowly, by repeated such occurrences the tooth will be shifted to a desired new position. A channel-shaped member 13 which, with regard to its function, may conveniently be referred to as "slip tube," is insertable in passage 14 of the device 10, as shown by arrow A. Welded to the orthodontic band 12 is also a conventional buccal tube 15, the device 10 being located mesially of the tube An arch wire 16 is received in the passage 14 of the device The end of the wire

16 is received in the buccal tube The device 10 locks the wire 16 to prevent only mesial movement of the wire 16 relative to the device 10, the wire 16 being free to move distally relative to the device Because of the locking effected by the device 10, the wire 16 is not projected through the distal end of the device 10 since conventional cinching has been made unnecessary by the device As shown in FIGS. A passage 14 is formed through the shell One wall 19 of the shell 18 has formed therein an indentation 20 defining an anvil The opposite wall 22 of the shell 18 is formed in part into a tension spring Suppose, however, that the slip tube was not inserted, which is shown in FIG. The spring 23 would bear against adjacent edge 16a of the wire 16, urging the opposite edge 16b of the wire 16 against the anvil It can readily be appreciated, in accordance with well understood mechanical principles, that, when the wire 16 is urged in the direction of arrow B, the spring 23 will immediately yield downwardly to permit motion of the wire 16 in the direction of arrow B in FIGS. It will readily be appreciated that, analogously, the spring 23 will permit the slip tube 13 to be inserted fully into the passage 14 of the device 10 from one end of the passage 14 but not from the opposite end of the passage Throughout the application, the convention is followed of labeling an arrow pointing in the direction in which the device according to the invention will move relative to the arch wire, except in FIGS. It will be apparent to orthodontists that the devices according to the invention have many applications. In that regard it is to be remembered that the devices of the invention may be inverted so that they will permit motion of the wire relative to the device in either direction. The arrangement of the devices on the molar 11 is exactly like that illustrated in FIG. Mounted on the adjacent premolar 24 by means of a conventional orthodontic band 25 is a conventional orthodontic bracket Arch wire 16 is engaged by the orthodontic bracket 26 the tie wire 28, which is twisted at 28a, fastening the wire 16 to the bracket 26 in the conventional manner , the device 10 and, finally, the buccal tube One or more teeth 27, only one of which is illustrated adjacent to the tooth 24 in the mesial direction may also be provided with orthodontic bands and brackets not illustrated. The device 10 herein is acting as a "stop" to prevent distal movement of the arch wire. The device 10 is capable of sliding in the direction of arrow B thus preventing the arch wire 16 from moving in that same direction. The device 10 may or may not be welded or attached to the orthodontic band The arrangement of FIG. The device 10 is capable of sliding along the arch wire 16 in the direction of arrow C thereby acting as a "cinching" lock, allowing the arch wire 16 to move distally, however preventing the wire from mesial movement. It can be readily appreciated that such a configuration can allow for activation of spring mechanisms in the anterior or buccal segments of the arch wire. The device 10 functions in exactly the same way in the arrangement of FIG. As illustrated, the device 10" would allow movement of the tooth along the wire 16 in the direction B. Inversion of the device 10" would, of course, allow the tooth to move along the wire in the direction opposite arrow B. The device as shown in FIG. It is apparent that both devices 10 are oriented to have the facility of sliding along the arch wire in the respective directions of both arrows B and C, thereby locking the tooth 27 in its position relative to the wire and preventing the tooth from moving in either the mesial or distal directions along the wire. The devices 10 are mounted on the wire only and are unattached to the orthodontic band surrounding the teeth Thus the devices 10 are capable of movement in the directions of arrows C, thereby mechanically locking the anterior segment of the teeth together as a unit or urging them together to close up the minor illustrated gaps. The illustrated configuration makes the conventional prior art of "figure eighting" or the tying together of the individual teeth 27 of the aforementioned segments unnecessary. Further application of segment moving would involve additional devices 10 to be located at the buccal tubes 15 in the configurations as illustrated in FIGS. These additional applications would allow, in conjunction with the applications illustrated in FIGS. Both devices 10 are arranged to exert pressure mesially thereby to hold the teeth 27 together as that group of teeth is urged distally by the arch wire The conventional arch wire 16, orthodontic bands 25, orthodontic brackets 26 and tie wires 28 are again being used.

Chapter 3 : Gardner Dexter Hiscox | Open Library

Mechanical movements, powers, devices, and appliances: comprising an illustrated description of mechanical movements and devices used in constructive and operative machinery and the mechanical arts.

An orthotic joint for pivotally connecting two orthotic bar members around an axis of rotation comprising: The orthotic joint of claim 1 wherein the spring is a spiral spring. The orthotic joint of claim 2 wherein the spring has a circumferential portion that extends around the axis of rotation of the joint. The orthotic joint of claim 2 wherein the spring encompasses the axis of rotation of the joint. The orthotic joint of claim 2 wherein the spiral spring comprises a spring eye and a spring flat, the spring flat connected to the upper member and the spring eye connected to the lower member. The orthotic joint of claim 5 wherein the spring eye is connected to the lower member by a pin. The orthotic joint of claim 2 wherein the spring is preloaded with a desired amount of tension. The orthotic joint of claim 2 wherein the spring is preloaded with between about and inch-pounds. The orthotic joint of claim 8 wherein the leaf spring encompasses the axis of rotation of the joint. The orthotic joint of claim 2 wherein the spring provides a force to facilitate pivotal movement of the upper and lower members between an extension and flexion portion. The orthotic joint of claim 2 wherein the spiral spring has less than one coil. The orthotic joint of claim 2 wherein the spiral spring has a rectangular cross section. The orthotic joint of claim 1 further comprising a stop means preventing relative movement between the members beyond a predetermined amount. The orthotic joint of claim 13 wherein the stop means prevents relative movement between the upper and lower members beyond 18 degrees. The orthotic joint of claim 1 wherein the torsion spring is a leaf spring. The orthotic joint of claim 1 wherein the joint is an elbow joint. A mechanical orthotic knee joint for pivotally connecting two orthotic members around an axis of rotation comprising: An orthotic appliance comprising a. The orthotic appliance of claim 18 wherein the spring is a spiral spring. The orthotic appliance of claim 19 wherein the spiral spring has a rectangular cross section. The orthotic appliance of claim 19 wherein the spring has a circumferential portion that extends around the axis of rotation of the joint. The orthotic appliance of claim 19 wherein the spiral spring comprises a spring eye and a spring flat, the spring flat connected to the upper member and the spring eye connected to the lower member. The orthotic appliance of claim 22 wherein the spring eye is connected to the lower member by a pin. The orthotic appliance of claim 19 wherein the spring is preloaded with a desired amount of tension. The orthotic appliance of claim 19 wherein the spring is preloaded with between about and inch-pounds. The orthotic appliance of claim 19 wherein the spring provides a force to facilitate pivotal movement to the upper and lower members between an extension and flexion portion. The orthotic appliance of claim 19 wherein the spiral spring has less than one coil. The orthotic appliance of claim 18 wherein said first knee joint has a stop means preventing relative movement between the members beyond a predetermined amount when the second knee joint is locked. The orthotic appliance of claim 28 wherein the stop means prevents relative movement between the upper and lower members beyond 18 degrees. The orthotic appliance of claim 18 wherein the torsion spring is a leaf spring. The orthotic appliance of claim 30 wherein the leaf spring encompasses the axis of rotation of the joint. A method for providing a desired amount of resistance during flexion of a mechanical orthotic knee joint comprising: The method recited in claim 32 comprising the further step of engaging the knee joint in the operative position so that the desired amount of resistance is provided during flexion. A method of providing a uniform degree of resistance for a person using a knee joint during walking comprising: More particularly, the invention relates to a knee orthosis or knee-ankle-foot orthosis and a mechanical knee joint incorporating a spring to control knee flexion and a method of providing desired resistance during knee flexion by use of the joint. A mechanical knee joint is frequently used to pivotally connect portions of the orthotic device secured to the body above and below the knee joint. Such a mechanical joint permits relative movement of the members and the associated body limbs and joints, to which the members are attached and the body joint to which the body parts are connected. During the normal stride of a normal person, there is a certain amount of natural muscle resistance during knee flexion in the quadriceps and hip muscles, for example. A need exists for a knee joint that simulates the resistance that an individual encounters during a normal walking stride. A need also exists for a knee joint that can provide different amounts of resistance depending upon the muscle strength of a particular patient. A need exists for a knee joint that is easily adjustable among several different degrees of resistance. A need also exists for a knee joint and knee orthosis that provides a relatively constant resistance throughout the flexion movement and can be preloaded to a set amount of resistance when the joint is in the full extension position. A further need exists for a knee joint that provides such resistance without requiring numerous precise parts that require close tolerances. The orthotic knee joint comprises two members that are typically elongated, a structure associated with each member for permitting pivotal movement of one member relative to the other between extension and flexion positions and a torsion spring operatively associated with the bar members to provide torsional resistance to restrain pivotal movement of the bar members between the extension and flexion positions. In accordance with another aspect of the present invention, a mechanical orthotic knee joint for pivotally connecting two orthotic members around an axis of rotation is provided comprising an upper and lower member, a structure associated with and connecting the upper and lower members for permitting movement of those members between extension and flexion positions and a torsion spring that is operatively associated with the members and extends longitudinally along the joint and one of the members to provide resistance to restrain pivotal movement. Another aspect of the invention provides an orthotic appliance comprising a foot support, a lower bar member, an upper bar member, an orthotic ankle joint for pivotally connecting the foot support to the lower bar member, a first knee joint for permitting pivotal movement of the lower bar member relative to the upper bar member, a second knee joint for locking and releasing the upper bar member relative to the lower bar member such as when the wearer is in a sitting position, and a torsion spring to provide resistance during movement of the bar members from an extension position to a flexion position during rotational movement of the first knee joint. Yet another aspect of the present invention is a method of providing a desired amount of resistance during flexion of a mechanical orthotic knee joint that comprises the steps of inserting a torsion spring into an orthotic device comprising two bar members connected by a mechanical knee joint. In one embodiment of the present invention, a torsion spring is loaded during flexion of the bar members. The loading of the torsion spring in the full extension position, as well as the type and size of the spring, determine the resistance in the joint. The torsion spring may also be used to limit the pivotal movement of the device. In accordance with another aspect of the invention, the desired resistance in knee flexion can be easily and quickly adjusted to provide a greater or lesser amount of resistance. Torsion springs with different characteristics such as having different dimensions or composed of different materials may be readily removed from or inserted into the joint. In one embodiment of the present invention, the preload of tension in the torsion spring in the device can be adjusted. The amount of preload helps determine the initial resistance of the torsion spring in the fully extended position and aids in simulating the resistance and support during the walking stride of a healthy individual. In accordance with yet another aspect of the present invention, the resistance during flexion is relatively constant. In the preferred embodiment, a substantial resistance can be obtained readily by use of a spiral torsion spring. In addition, the device of the present invention may be constructed to allow for different maximum ranges of flexion for different walking strides. In accordance with another aspect of the present invention, one end of the torsion spring is operatively attached directly or indirectly to the upper member. Another end of the torsion spring is operatively attached to the lower member. To cause the lower member to pivot about the joint, sufficient force must be supplied to overcome the resistance of the torsion spring to compression. Another aspect of the present invention provides a mechanical knee joint that is relatively simple to assemble, reliable and economical. The present invention uses a small number of parts and these parts to provide the desired resistance do not need to be machined or fabricated to close tolerances to work effectively. The preferred embodiment of the present invention utilizes a spiral torsion spring.

Chapter 4 : Built-In Domestic Appliance - BSH BOSCH UND SIEMENS HAUSGERATE GMBH

Mechanical movements, powers, devices, and appliances, comprising illustrated description of mechanical movements and devices used in constructive and operative machinery and the mechanical arts, being practically a mechanical dictionary, commencing with a rudimentary description of the early known mechanical powers and detailing the various motions, appliances and inventions used in the.

But John Ruskin, William Morris, and the other reformers in the late nineteenth century rejected machines and industrial production. On the other hand, steampunk enthusiasts present a "non- luddite critique of technology". The station is reminiscent of a submarine, sheathed in brass with giant cogs in the ceiling and portholes that look out onto fanciful scenes. The 3D moon movie was created by Antony Williams. Jim Bennett, museum director. A year later, a more permanent gallery, Steampunk HQ , was opened in the former Meeks Grain Elevator Building across the road from The Woolstore, and has since become a notable tourist attraction for Oamaru. An Exhibition of Steampunk Art and Appliance made its debut. Grymm" Marsocci, [31] and Christopher Conte. Falksen , wearing a steampunk-styled arm prosthesis created by Thomas Willeford , exemplifying one take on steampunk fashion Main article: Steampunk fashion Model Ulorin Vex wearing post-apocalyptic steampunk attire designed by Kato Steampunk fashion has no set guidelines but tends to synthesize modern styles with influences from the Victorian era. Such influences may include bustles , corsets , gowns, and petticoats ; suits with waistcoats , coats, top hats [56] and bowler hats themselves originating in England , tailcoats and spats ; or military-inspired garments. Steampunk-influenced outfits are usually accented with several technological and "period" accessories: Modern accessories like cell phones or music players can be found in steampunk outfits, after being modified to give them the appearance of Victorian-era objects. Post-apocalyptic elements, such as gas masks, ragged clothing, and tribal motifs, can also be included. Aspects of steampunk fashion have been anticipated by mainstream high fashion, the Lolita and aristocrat styles, neo-Victorianism, and the romantic goth subculture. Under the Gunn" reality series , contestants were challenged to create avant-garde "steampunk chic" looks. The instructional book, aimed at young programming students, depicts Holmes using the engine as an aid in his investigations, and lists programs that perform simple data processing tasks required to solve the fictional cases. The August issue of Amazing Stories featuring work by H. Wells In , the first version of the science fiction roleplaying game Space: The game is set in an alternative history in which certain now discredited Victorian scientific theories were probable and led to new technologies. This setting was different from most steampunk settings in that it takes a dim and dark view of this future, rather than the more prevalent utopian versions. A retrospective reprint anthology of steampunk fiction was released, also in , by Tachyon Publications. Edited by Ann and Jeff VanderMeer and appropriately entitled Steampunk , it is a collection of stories by James Blaylock , whose "Narbondo" trilogy is typically considered steampunk; Jay Lake , author of the novel Mainspring , sometimes labeled " clockpunk "; [69] the aforementioned Michael Moorcock; as well as Jess Nevins , known for his annotations to The League of Extraordinary Gentlemen first published in Younger readers have also been targeted by steampunk themes, by authors such as Philip Reeve and Scott Westerfeld. Historical steampunk tends to be science fiction that presents an alternate history; it also contains real locales and persons from history with alternative fantasy technology. Self-described author of "far-fetched fiction" Robert Rankin has increasingly incorporated elements of steampunk into narrative worlds that are both Victorian and re-imagined contemporary. In , he was made a Fellow of the Victorian Steampunk Society. In the comic book and the first film , Karl Ruprecht Kroenen is a Nazi SS scientist who has an addiction to having himself surgically altered, and who has many mechanical prostheses, including a clockwork heart. The Golden Army , as an ectoplasmic medium a gaseous form in a partly mechanical suit. This second film also features the Golden Army itself, which is a collection of 4, mechanical steampunk warriors. Alternative world[edit] Steampunk-style composite apparatus Since the s, the application of the steampunk label has expanded beyond works set in recognisable historical periods, to works set in fantasy worlds that rely heavily on steam- or spring-powered technology. One of the first steampunk novels set in a Middle Earth -like world was the Forest of Boland Light Railway by BB , about gnomes who build a steam locomotive. The gnomes and goblins in World of Warcraft also have technological societies that could be described as steampunk, [76] as they are vastly ahead of the technologies of men , but still run on steam and mechanical power. The Dwarves of the Elder Scrolls series , described therein as a race of Elves called the Dwemer, also use steam powered machinery, with gigantic brass-like gears, throughout their underground cities. The Dark Project , as well as the other sequels including its reboot , feature heavy steampunk-inspired architecture, setting, and technology. Amidst the historical and fantasy subgenres of steampunk is a type that takes place in a hypothetical future or a fantasy equivalent of our future involving the domination of steampunk-style technology and aesthetics. In , musician Thomas Dolby heralded his return to music after a year hiatus with an online steampunk alternate fantasy world called the Floating City, to promote his album A Map of the Floating City. Several other categories have arisen, sharing similar names, including dieselpunk , clockwork-punk , and others. Most of these terms were coined as supplements to the GURPS role playing game, and are not used in other contexts. Cyberpunk derivatives A steampunk horror costume Kaja Foglio introduced the term "Gaslight Romance", [20]: But the latter category focuses nostalgically on icons from the late years of that century and the early years of the 20th centuryâ€”on Dracula, Jekyll and Hyde, Jack the Ripper, Sherlock Holmes and even Tarzanâ€”and can normally be understood as combining supernatural fiction and recursive fantasy , though some gaslight romances can be read as fantasies of history. The Peshawar Lancers by S. Stirling is set in a post-apocalyptic future in which a meteor shower in caused the collapse of Industrialized civilization. The movie 9 which might be better classified as "stitchpunk" but was largely influenced by steampunk [82] is also set in a post-apocalyptic world after a self-aware war machine ran amok. The most common historical steampunk settings are the Victorian and Edwardian eras , though some in this "Victorian steampunk" category are set as early as the beginning of the Industrial Revolution and as late as the end of World War I. Some examples of this type include the novel The Difference Engine , [84] the comic book series League of Extraordinary Gentlemen , the Disney animated film Atlantis: Other comic series are set in a more familiar London, as in the Victorian Undead , which has Sherlock Holmes , Doctor Watson , and others taking on zombies, Doctor Jekyll and Mister Hyde , and Count Dracula , with advanced weapons and devices. For example, Morlock Night, written by K. Jeter , revolves around an attempt by the wizard Merlin to raise King Arthur to save the Britain of from an invasion of Morlocks from the future. Asian silkpunk [edit] Fictional settings inspired by Asian rather than Western history have been called "silkpunk". The term appears to originate with the author Ken Liu , who defined it as "a blend of science fiction and fantasy [that] draws inspiration from classical East Asian antiquity", with a "technology vocabulary There is a broad range of musical influences that make up the Steampunk sound, from industrial dance and world music [59] to folk rock , dark cabaret to straightforward punk, [95] Carnatic [96] to industrial , hip-hop to opera and even industrial hip-hop opera , [97] [98] darkwave to progressive rock , barbershop to big band. Joshua Pfeiffer of Vernian Process is quoted as saying, "As for Paul Roland , if anyone deserves credit for spearheading Steampunk music, it is him. He was one of the inspirations I had in starting my project. He was writing songs about the first attempt at manned flight, and an Edwardian airship raid in the mids long before almost anyone else In addition, the album Clockwork Angels and its supporting tour by progressive rock band Rush contain lyrics, themes, and imagery based around Steampunk.

Chapter 5 : Catalog Record: Mechanical movements, powers and devices | Hathi Trust Digital Library

Loading Mechanical movements, powers, devices, and appliances: comprising an illustrated description of mechanical movements and devices used in constructive and operative machinery and the mechanical arts / by Gardner D. Hiscox.

However, the method of fabrication described in this document envisages the removal of a part of the structural layer from the back to free the suspended structures and hence does not teach a fabrication process with removal of a buried sacrificial layer capable of preventing simultaneous removal of the insulating regions. In fact, in the latter case, there exists the risk that the agents used for removing the buried sacrificial layer will also remove the insulating regions, thus impairing the integrity and functionality of the gyroscope. According to one aspect of the invention, the insulation of the suspended parts to be separated electrically is obtained by forming trenches filled with insulating material typically oxide or oxide and polysilicon. The bottom ends of the insulating regions are protected by bottom plugs of material resistant to the etching for freeing the mobile structures, whilst the top ends are protected by top plugs. The following description regards an embodiment of a gyroscope, having suspended regions formed by at least two parts to be electrically insulated, as well as the manufacturing process thereof. The gyroscope 1 is formed by two parts 2 a, 2 b, which are symmetrical with respect to a central symmetry axis designated by A and are connected together via two central springs 3, arranged symmetrically with respect to a horizontal centroidal axis, designated by B. Each part 2 a, 2 b comprises an actuation system 5, an accelerometer 6, and a mechanical connection 7, which connects the actuation system 5 to the accelerometer 6. In the following description, reference will be made to the left-hand part 2 a, but the description is perfectly applicable also to the right-hand part 2 b. In detail, the actuation system 5 comprises an actuation mass 10 having an open concave shape C shape ; mobile actuation electrodes 11, connected to the actuation mass 10; and fixed actuation electrodes 13, comb-fingered to the mobile actuation electrodes The actuation mass 10 is supported by first and second anchorages 15 a, 15 b via two first and two second anchoring springs 16 a, 16 b, connected to the actuation mass 10 next to the four outer corners of the actuation mass The accelerometer 6 comprises a sensing mass 20 and mobile sensing electrodes 21, comb-fingered to first and second fixed sensing electrodes 22 a, 22 b. The sensing mass 20 is surrounded on three sides by the actuation mass 10 and is supported thereby through two first coupling springs 25 a and two second coupling springs 25 b. The coupling springs 25 a, 25 b form the mechanical connection 7 and are connected to the sensing mass 20 next to the corners. The mobile sensing electrodes 21 extend from the sensing mass 20 from the side of this not facing the actuation mass The sensing mass 20 is divided into a first part 20 a and a second part 20 b by a first insulating region 23; likewise, the actuation mass 10 is divided into a main portion 10 a and two end portions 10 b by two second insulating regions In detail, the first insulating region 23 extends approximately parallel to the central symmetry axis A so that the first part 20 a of the sensing mass 20 is supported and connected to the actuation mass 10 only via the first coupling springs 25 a, while the second part 20 b of the sensing mass 20 is supported and connected to the actuation mass 10 only via the second coupling springs 25 b. Furthermore, the second insulating regions 24 extend transversely to the respective C-shaped arms so that the main portion 10 a of the actuation mass 10 is connected only to the first coupling springs 25 a and to the first anchoring springs 16 a, while the end parts 10 b of the actuation mass 10 is connected only to the second coupling springs 25 b and to the second anchoring springs 16 b. The position of the second insulating regions 24 is moreover such that the mobile actuation electrodes 11 extend starting from the main portion 10 a of the actuation mass 10 and are electrically connected thereto. Actuation biasing regions 27, of buried type, are connected to the first anchoring regions 15 a; first sensing biasing regions 28, which are also of buried type, are connected to the second anchoring regions 15 b; second sensing biasing regions 29 are connected to the first fixed sensing electrodes 22 a; and third sensing biasing regions 30 are connected to the second fixed sensing electrodes 22 b through a supporting region In this way, the first part 20 a of the sensing mass 20, the first coupling springs 25 a, the main portion 10 a of the actuation mass 10, the mobile actuation electrodes 11, the first anchoring springs 16 a, and the first anchoring regions 15 a are all set at a same potential, applied via the actuation biasing regions 27, and are electrically insulated, via the insulating regions 23, 24, from the rest of the suspended structures, which include the second part 20 b of the sensing mass 20, the second coupling springs 25 b, the end portions 10 b of the actuation mass 10, the second anchoring springs 16 b, and the second anchoring regions 15 b, biased via the first sensing biasing regions Hereinafter, with reference to , a first embodiment of a process for manufacturing the gyroscope 1 of FIG. For example, the insulating layer 42 can be formed by a multilayer, comprising a bottom oxide layer grown thermally and a top layer of deposited silicon nitride. Then a polycrystalline semiconductor material layer, typically silicon, is deposited, and this is removed selectively so as to form buried connection regions in the example, the second and third sensing biasing regions 29, To this aim, a polysilicon layer for example with a thickness of nm is deposited. This is oxidized superficially and, via an appropriate mask, is removed selectively, so that the bottom protective region 44 comprises a polysilicon region 44 a and an oxide region 44 b. For the gyroscope of FIG. In particular, each bottom plug element 46 has a width greater than the respective insulating region 23, 24, so as to close it underneath also in case of slight misalignment in the corresponding masks, as will be obvious to the person skilled in the art. The wafer 40 is then masked, and the sacrificial oxide layer 43 is selectively removed so as to form openings 47 at the biasing regions in FIG. After planarization of the wafer 40 and doping of the polysilicon layer 50, the polysilicon layer 50 is etched so as to form trenches 51 FIG. The trenches 51 extend downwards as far as the bottom plug element 46, since etching of the silicon terminates automatically when the oxide region 44 b is reached. Then, the trenches 51 are filled with dielectric material, typically oxide, or oxide and polysilicon, to form the insulating regions 23, 24 whereof, in the cross-sectional view of FIG. Also the top plugs 52 follow the layout of the insulating regions 23, 24, and also these are of greater width, so as to guarantee the top protection of the insulating regions 23, Next, in a way not shown, metal regions are formed where necessary, and FIG. Then, using an appropriate resist mask not illustrated , the hard-mask layer 53 is etched, and see FIG. To this end, and in a per se known manner, the sacrificial layer 43 is removed through the trenches 54 underneath the trenches 54 and underneath the thin structures to this end, as illustrated in FIG. An air gap 55 is then formed where the sacrificial layer 43 has been removed. The structure of FIG. It should moreover be noted that the insulating region 23 is closed underneath by the bottom plug element 46 and at the top by the top plug element In practice, in the bottom plug element 46, the top protective region 45 of silicon carbide guarantees electrical insulation of the bottom protective region 44 and in particular of the polysilicon region 44 a with respect to the parts 20 a and 20 b of the sensing mass 20 and thus of the two parts 20 a, 20 b with respect to each other. The top protective region 45 moreover forms a first barrier to etching. The oxide region 44 b guarantees, in addition to the top protective region 45, that the etching stops on the bottom plug element 46 while defining the mobile structures and moreover improves electrical insulation. The polysilicon region 44 a guarantees protection from beneath of the other portions of the bottom plug element 46 and thus of the insulating region 23, 24 during removal of the sacrificial layer It should be noted that the insulating regions 23, 24 are not protected on the side facing the trenches 54 during etching of the polysilicon layer 50; however, in this direction, the removal of a small portion of the insulating regions 23, 24 is not problematical, given the thickness, in the direction considered of the insulating regions 23, Alternatively, the top protective region 45 can be formed by a single layer of silicon nitride, instead of silicon carbide. In this figure, which illustrates the structure in an intermediate manufacturing step before removal of the sacrificial layer 43, the bottom plug element 46 is formed by a single region of silicon carbide In this case, the region of silicon carbide 58 has the function both of electrical insulation and of stop etch and of protection during the removal of the sacrificial layer. The manufacturing process is similar to the above, except for the fact that it requires a single step for depositing the silicon carbide and its definition, instead of the steps described with reference to FIGS. In this figure, the bottom plug element 46 is formed again by a bottom protective region 44 and by a top protective region 45, as described with reference to FIG. The bottom protective region 44 is formed also here by a polysilicon region 44 a and an oxide region 44 b. In this case, the top portion 45 b of the top protective region 45 forms a barrier to the doping agents present in the polysilicon layer 50 and thus improves electrical insulation between the polysilicon layer 50 and the bottom protective region The plug element of is obtained by forming the bottom protective region 44, as described with reference to FIG. They are then removed partially only at the trenches 54 during definition of the suspended structures FIG. According to yet another embodiment not illustrated , only the silicon carbide layer 45 a is provided and extends underneath the entire polysilicon layer 50 in a way similar to what is illustrated in FIG. To this end, after defining the bottom protective region 44, as described with reference to FIG. This solution is advantageous in that it saves a mask. Finally, it is clear that numerous modifications and variations can be made to the process and to the insulating structures described and illustrated herein, all falling within the scope of the invention, as defined in the annexed claims. In particular, it is emphasized that the insulating structure comprising the insulating regions 23, 24 and the corresponding plug elements 46 can be used also for MEMS of different types. All of the above U. From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims. A micro-electro-mechanical structure comprising: The structure according to claim 1 wherein said insulating region has a preset width and layout, and said plug element has said layout and a width greater than said insulating region. The structure according to claim 1 wherein said plug element comprises a bottom protective region and an auxiliary protective region surrounding at least laterally said bottom protective region. The structure according to claim 3 wherein said bottom protective region comprises a polycrystalline silicon portion facing said air gap. The structure according to claim 4 wherein said bottom protective region further comprises a silicon oxide portion overlying said polycrystalline silicon portion. The structure according to claim 3 wherein said auxiliary protective region further extends on top of said bottom protective region and comprises a silicon carbide layer. The structure according to claim 6 wherein said auxiliary protective region further comprises an auxiliary layer overlying said silicon carbide layer, said auxiliary layer being chosen between silicon nitride and silicon carbide. The structure according to claim 6 wherein said auxiliary protective region extends underneath said suspended mass throughout its extension. The structure according to claim 3 wherein said auxiliary protective region comprises silicon nitride spacers. The structure according to claim 1 wherein said plug element comprises a silicon carbide region. The structure according to claim 1 comprising a gyroscope, said suspended mass forming an accelerometer of said gyroscope, including a first part electrically connected to an actuation assembly and a second part electrically connected to sensing electrodes. A micro-electro-mechanical structure, comprising: The micro-electro-mechanical device of claim 12 wherein the first insulating region comprises first and second insulating portions, the first insulating portion lying between the second insulating portion and a first surface of the first suspended mass. The micro-electro-mechanical device of claim 13 wherein first insulating portion includes a plurality of insulating layers. The micro-electro-mechanical device of claim 13 wherein the first insulating region comprises a third insulating portion lying between the second insulating portion and a second surface of the first suspended mass. The micro-electro-mechanical device of claim 12 further comprising a second suspended mass movably suspended from the first suspended mass, the second suspended mass including a second insulating region extending through the second suspended mass and separating the second suspended mass into third and fourth regions electrically isolated from each other. The micro-electro-mechanical device of claim 16 wherein the second insulating region comprises first and second insulating portions, the first insulating portion lying between the second insulating portion and a surface of the second suspended mass. The micro-electro-mechanical device of claim 12 wherein: The micro-electro-mechanical device of claim 12 , further comprising: The micro-electro-mechanical device of claim 20 , further comprising: The micro-electro-mechanical device of claim 21 , further comprising: The micro-electro-mechanical device of claim 22 , further comprising: A micro-electro-mechanical device, comprising: A micro-electro-mechanical device of claim 24 wherein the protecting means includes a plug region formed along a length of the insulating region and between the insulating region and the second surface of the suspended mass. The micro-electro-mechanical device of claim 24 , further comprising: A process for manufacturing a micro-electro-mechanical structure, comprising:

Chapter 6 : Steampunk - Wikipedia

Mechanical Movements, Powers, Devices, and Appliances: Comprising an Illustrated Description of Mechanical Movements and Devices Used in Constructive and Operative Machinery and the Mechanical Arts by Gardner Dexter Hiscox starting at.

A wire or other conductive lead is connected to a circuit in a manner that makes the connection more resistant to mechanical stresses such as movement or rotation of the lead relative to the circuit. A material is configured around the lead and near the point of connection to the circuit so as to create a region of decreasing flexibility or graduated stiffness near the point of connection. In certain embodiments, the lead may also be coiled or otherwise shaped to provide additional ability to withstand mechanical stresses. More specifically, the present invention provides for a connection between a lead and a circuit in a manner that makes the connection more resistant to fatigue failure caused by mechanical stresses such as movement or rotation of the lead relative to the circuit. In the present invention, a material is configured around the lead and near the point of connection to the circuit so as to create a region of decreasing flexibility or graduated stiffness near the point of connection. In certain embodiments, the lead may also be coiled or otherwise shaped to provide additional ability to accommodate mechanical strain without failure. The present invention primarily concerns physical factors such as mechanical stress leading to fatigue, which in turn can cause a circuit malfunction by physically breaking or weakening a specific part of the circuit. A typical location for such malfunction is at or near the point of connection of a wire, lead, or other conductor to an electrical circuit. Mechanical stresses such as repeated bending or twisting, for example, can lead to a weakening of the wire until a break occurs. As lead 20 is twisted as illustrated by arrow A , repeatedly bent as illustrated by arrows B and C , or placed into tension or compression arrow D , a concentration of stress occurs at or near the point of connection Over time, as lead 20 is exposed to repeated mechanical cycles that provide for this concentration of stress, lead 20 may eventually weaken due to repeated deformation or cyclical movement. As a result, lead 20 will likely suffer a fatigue failure or break either at or near point of connection Again, as lead 20 is subjected to a variety of forces as illustrated by arrows A, B, C, and D, lead 20 may weaken and eventually break due to repeated deformations at or near point of connection An electrical connection more resistant to various forces and less likely to undergo fatigue failure is desirable. SUMMARY Various features and advantages of the invention will be set forth in part in the following description, or may be apparent from the description. The present invention provides an electrical connection, and a method of creating such connection, that is resistant to mechanical stresses that can occur when a wire or lead is twisted or caused to bend repeatedly about its connection to a circuit. Generally speaking, with the present invention a material is provided that surrounds the lead near the point of connection to the circuit so as to create a region of decreasing flexibility or graduated stiffness near the point of connection. The material is selected and configured with the lead so that it will at least partially distribute some of the mechanical stress created by movement or twisting of the lead relative to a substrate or other surface carrying the circuit to which the lead is connected. As such, a more robust connection to certain mechanical stresses is realized. In certain embodiments, the lead may also be coiled or otherwise shaped to provide an additional ability to absorb and dissipate mechanical forces. A variety of materials may be used to create the region of graduated stiffness about the lead, and some representative examples are provided herein. Selected exemplary embodiments and methods, including preferred, of the present invention are here summarized by way of explanation of the invention and not limitation of the invention. In one exemplary method of the present invention, a process for creating a fatigue-resistant electrical connection is provided in which an electrical conductor having at least one end is configured for connecting to an electrical circuit. A predetermined length of the electrical conductor proximate such end is positioned within a distributor. The distributor is configured for distributing stress over a predetermined length of the electrical conductor. The distributor is attached to a support surface, such as a printed circuit board for example, that is stationary relative to the electrical circuit. The distributor can be attached in a variety of ways including adhesion, bonding, or a mechanical connection. The end of the electrical conductor is connected to the electrical circuit. Such connection may include soldering or a mechanical connection such as a crimp. Preferably, although not required, the electrical conductor is adhered to the distributor along the predetermined length of the conductor that is positioned within the distributor. The distributor is constructed from a material capable of distributing stress along the predetermined length of the conductor, preferably a resilient material. While a variety of resilient materials might be employed, some examples include rubbers or other elastomeric materials. To further enhance the stress-resistance of the circuit, the conductor may be constructed from a wire that is coiled or otherwise shaped in a manner that helps distribute stress. Where necessary, the conductor may be coated with an insulating material to prevent conduction through the distributor. In another exemplary method of the present invention, a process for assembling a strain-resistant electrical connection to an electrical circuit is provided. The process includes providing a resilient material capable of distributing mechanical forces. A portion of an electrical conductor proximate to one of its ends, referred to as a first end, is positioned within the resilient material. The resilient material is attached to a support, which may be a printed circuit board or otherwise. The first end of the electrical conductor is connected to the electrical circuit in a manner that fixes the position of the first end relative to the support. As such, the resilient material provides a transition zone for the electrical conductor in which the flexibility of the electrical conductor decreases along a direction from the point of entry of the conductor into the resilient material towards the point of connection of the first end to the electrical circuit. The present invention also provides embodiments of a stress-resistant electrical connection. In one exemplary embodiment of the present invention, a durable connection for an electrical circuit is provided that includes a substrate supporting at least a portion of the electrical circuit. A conductor is included that has at least one connecting end attached to the electrical circuit. A resilient material is positioned proximate to the connecting end and surrounds a predetermined portion of the conductor. The resilient material is attached to the substrate and is configured for gradually restricting the mobility of the conductor along the end in a direction moving along the conductor and towards the electrical circuit. In another exemplary embodiment, the present invention provides a strain-resistant electrical connection to an electrical circuit that includes a material for distributing stress. A wire is provided having a first end; a portion of the conductor near the first end is embedded within the material for distributing stress. This embodiment includes a wire-connector that is in electrical communication with the circuit. The wire connector encloses at least a portion of the stress distributing material and physically contacts and restrains the wire at a location proximate to its first end so as to provide an electrical connection. The material for distributing stress is attached to a support surface that is substantially immovable relative to the circuit. The material for distributing stress is configured to provide a zone of graduated stiffness about the wire at a location proximate to the first end. These and other features, aspects and advantages of the present invention will become better understood with reference to the following description and appended claims. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention. Repeat use of reference characters throughout the present specification and appended drawings is intended to represent same or analogous features or elements of the invention. Each example is provided by way of explanation of the invention, and not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment can be used with another embodiment to yield still a third embodiment. It is intended that the present invention include these and other modifications and variations. A printed circuit board 36 is shown as might be found in any electronics. For this particular example, a wire or other electrical lead 38 is connected to a component 40 on board While a number of connections may be used with the present invention, FIG. Printed circuit board 36 is used to illustrate this particular exemplary embodiment; the present invention is not limited to use with only a circuit board. Adjacent to connection 42 is a distributor 44 that is attached to board Lead 38 is embedded within distributor 44 to create a transition zone

45 FIG.

Chapter 7 : Library Resource Finder: More Details for: Mechanical movements : powers, devices a

2. Mechanical movements, powers, devices, and appliances, comprising illustrated description of mechanical movements and devices used in constructive and operative machinery and the mechanical arts, being practically a mechanical dictionary, commencing with a rudimentary description of the early.

Filed July 27, , Ser. The use of a nut and screw assembly for translating rotary to linear motion is not, of course, new. However, until some years ago, it was necessary to utilize clutch mechanisms and the like to prevent jamming of the nut and screw when the linear movement reached a predetermined limit. The necessity of using clutch mechanisms and similar complicated and expensive mechanisms was then elimi nated by the introduction of an overrunning screw and nut assembly wherein the assembly consisted of a screw with a helical ball race and a nut machine, on the inside diameter, with a series of concentric grooves. A ball retainer was interposed between the nut and screw and served to position the balls in spaced relationship consistent with the points where the annular grooves in the nut aligned with the helical grooves on the screw. When transmitting torque, the balls rolled between the screw and the nut because the balls were held captive in the annular grooves of the nut and could not thread out, thereby advancing the nut along the screw while the nut travelled axially along the screw. The retainer rotated in the same manner as the arm of a planetary gear system. When the retainer lug struck one of the stop pins located on the screw for the purpose of limiting axial travel, the retainer and balls rotated as a unit with the screw. The balls then rolled in the concentric grooves of the nut and slid on the screw without imparting any further axial advance of the nut, thereby providing a free-wheeling feature. When the power source reversed screw rotation, the stop pin moved away from the retainer, allowing the balls to again roll in the helical grooves of the screw, thereby advancing the nut in the opposite direction. Although the above-described type of free-wheeling nut and screw assembly proved to be a great improvement over the former use of clutch mechanisms and the like, there were various objectional features inherent in the device, such as the necessity of using balls and matching grooves, both on the nut and on the screw, which had to be highly and expensively machined in order to obtain the close tolerances which were absolutely necessary for effective operation of the device. It also required the use of an additional element, namely the ball retainer, which increased the manufacturing cost, as well as the cost of maintenance and replacement. Another serious objection was the inherent limitation of the load carrying capacity of the device, since the greatest number of balls that could be used was deter mined by the number of concentric grooves that could be accurately machined within the nut. Furthermore, in practice, the thrust angle had to be reduced as much as possible within the physical limits of the component parts in order to increase the load carrying capacity of the balls. In addition, extreme caution had to be taken to prevent the balls from working too close to the crest of the ball races to prevent chipping and fracture. It was also necessary, because of the many highly machined parts and their close tolerances, to keep the device constantly lubricated in order to obtain maximum efficiency and prevent early damage and wearing out of the parts. It is one object of the present invention to overcome the above and other disadvantages of the aforementioned type of free-wheeling nut and screw assemblies by providing a nut and screw assembly which utilizes fewer parts, requires less accurate machining of the parts, and which has a load carrying capacity that is not limited by the number of balls, the number of concentric grooves or the helix angle of the screw. Another object of the present invention is to provide a nut and screw assembly of the aforementioned type which does not require the constant addition of lubricating oil or the like. Another object of the present invention is to provide a nut and screw assembly of the aforementioned type which is relatively simple in construction, inexpensive to produce and requires a minimum of maintenance and replacement of parts due to wear. Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following description when read in conjunction with the accompanying drawings wherein: Referring now in greater detail to the figures of the drawing wherein similar reference characters refer to similar parts, there is shown an assembly, generally designated 10, which comprises a hollow, tubular shaft 12 having a transverse aperture 14 at one end for holding a rivet, bolt, screw or the like for pivotally connecting the shaft to a member to be actuated. Closely fitted within the tube 12 is a nut 16, preferably constructed of a self-lubricating plastic such as Delrin an acetal resin produced. The nut 16 is of such diameter that it snugly fits within the hollow tube 12 with sufficient frictional engagement to normally prevent rotation of the nut within the tube. This frictional engagement is effected despite the low ceefiicient of friction of the Delrin because of the relatively large surface area around the outer periphery of the nut compared to the fine threads on the interior of the nut which are also made of Delrin and therefore also have a low coelficient of friction. However, this frictional engagement may be overcome when a rotational force of sufiicient intensity is applied to the nut. The nut 16 is further provided with an outer peripheral groove 18 and, extending through this groove tangentially to the nut, are one or more here shown as two roll pins These roll pins 20 are shown as being oppositely-disposed, and the ends of each extend through corresponding apertures in the tube 12 as best shown in FIG. Rigidly secured in the nut 16 and extending axially thereof so that its ends project from opposite radial faces of the nut 16 is a pin The nut 16 is provided with a threaded central opening through which extends a screw-threaded shaft This shaft 24 may be rotated by any desirable operating means but is herewith shown operatively connected to a reversible electrical motor 26 of standard design. The screw shaft 24 is further provided with a radially extending stop pin adjacent each end, these stop pins being respectively designated 28 and In operation, as the motor 26 rotates the screw shaft 24 in one direction, since the nut 16 is held in frictional engagement with the inner wall of the tubular shaft 12, the nut and the tubular shaft 24 move, as a unit, axially of the screw shaft 24 to the left as viewed in FIG. The continued rotation of the screw shaft 24 causes the pin 22, in lateral engagement with the pin 28, to exert a rotational force on the nut 16, through the pin 28, sufiicient to overcome the frictional retaining force of the mating nut and tube peripheries and of the roll pins The nut then rotates with the shaft 24 In effect, therefore, the shaft 24 When the motor 26 is operated in the reverse direction, the pin s rotated in the opposite direction and becomes disengaged from the pin The nut 16 is then again frictionally held against axial movement rela-. The nut 54 and roll pins 56 also correspond to the respective members 16 and 20, while the stop pins 58 and 60 correspond to the pins 28 and 30 although extending radially in two directions from the screw shaft. However, the nut 54 is not provided with any axial pin, such as pin 22, whereas the screw shaft 52 is provided with a loose washer adjacent each end, these washers being designated as 62 and 64 respectively. In the operation of the mechanism of FIG. Continued rotation of the screw shaft, since it cannot overcome the stopping force of the pin 58, overcomes the frictional holding force on the periphery of the nut, and the nut then rotates together with the screw shaft. The washer 62 here acts as a buffer to prevent injury to the nut by the pin A further modification of the invention is illustrated in FIG. This assembly is identical to that shown in FIG. The rib and flange also provide frictional engagement for the nut. They, therefore, serve the same general functions as the roll pins 20 of FIG. The mechanism of FIG. However, if desired, these may be replaced by an axial pin such as pin 22 and radial pins such as pins 28 and 30 in FIG. The above-described mechanism obviously possesses a great many uses in mechanical systems. One such use is illustrated in FIG. The linkage is operated through a lifting lever actuated by a bell crank , while the linkage is operated by a lifting link The bell crank is actuated by a nut and screw assembly connected to an electrical motor , while the lifting link is directly actuated by a nut and screw assembly connected to an electrical motor The entire construction and operation of the bed of FIG. Although the screw shaft has been illustrated above as being axially fixed while the nut and tubular shaft move axially thereof, it is within the scope of the invention to make the nut and tubular shaft axially fixed while moving the screw shaft axially. Obviously, many modifications of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described. The invention claimed is: A mechanical movement device comprising a first shaft and a second shaft, said shafts being operatively connected for axial movement relative to each other, the firstshaft being screw-threaded and the second shaft being held against rotation and having a nut threadedly engagedwith said first shaft, said nut being axially fixed relative to said second shaft, restraining means normally holding said nut rotationally fixed relative to said second shaft whereby relative rotation between said first shaft and said nut provides relative axial movement between said first and second shafts, and restraint overcoming means on said first shaft for overcoming said restraining means upon predetermined axial movement of said shafts relative to each other, the overcoming of said restraining means causing said nut to rotate with said first shaft relative to said second shaft to discontinue relative axial movement of said shafts. The device of claim 1 wherein said restraint overcoming means on said first shaft is a radial projection laterally engageable with an axial projection on said nut to rotate said nut in conjunction with rotation of said first shaft. The device of claim 1 wherein said restraint overcoming means on said first shaft is a radial projection constructed to abut the corresponding radial face of the nut upon said predetermined axial movement of said shafts to prevent further axial movement of said nut in one direction. It is also possible to substitute one 4. The device of claim 4 wherein said contact means is an axially projecting pin fixed to said nut and rotatably engaged by said stop means during rotation of said first shaft. The device of claim 4 wherein said contact means is a radial face of said nut against which said stop means exerts an axial restraining force. The device of claim 4 wherein said nut is axially fixed relative to said second shaft by at least one pin, said nut having an outer peripheral groove, the opposite ends of said pin extending through corresponding apertures in said second shaft, and an intermediate portion o of said pin being positioned in said groove in tangentially frictional engagement with said nut. The device of claim 4 wherein said nut is axially fixed relative to said second shaft by at laest one pin, said hollow shaft on one side of said nut and a flange on said hollow shaft on the opposite side of said nut. The device of claim 4 wherein said nut is constructed of a polymeric material having a low coefficient of friction. In a foldable bed having a frame having a plurality of sections hinged to each other, and having a linkage operatively connected to at least one of said sections for moving said section relative to other sections, a nut and screw device operatively connected to and for operation of said linkage, said nut and screw device comprising:

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