PATENTS EXAMINATION BOARD

PRACTICAL LEGAL PROBLEMS

SUPPLEMENTARY EXAMINATION: NOVEMBER 2015

EXAMINERS: R BAGNALL
D DOHMEN

MODERATOR: C.E. PUCKRIN S.C.

DURATION: READING TIME – 60 mins
EXAMINATION TIME – 4 hrs
TOTAL – 5 hrs

NOTES TO CANDIDATES:

1. Attached to the paper are copies of the following documents:
   (i) A copy of the Patents Act No. 57 of 1978;
   (ii) A copy of the Patent Regulations 1978; and
   (iii) A copy of the Uniform Rules of the High Court under the Superior Courts Act 10 of 2013 (Rules 6, 14, 17, 18, 19, 21, 22, 23, 24, 25, 30, 35, 36 and 37).

2. Each candidate is also allowed access to (1) one dictionary during the exam.

3. This paper comprises copies of the following documents:
   (i) Questions 1, 2 and 3 (100 marks);
   (ii) Document A: ZA 2010/3001;
   (iii) Document B: Excerpt of Internet Blog by S. Cauliscrest, Snowclone Corp;
   (iv) Document C: Bigg, H. Naflinger, "Recent results on snowboard oscillation modes", in Steigen & Bergen, Journal of Managing Risk and Fun;
   (v) Document D: EP 2 001 836 A 1;
   (vi) Document E: US 6,001,618 A;
   (vii) Document F: EP 2 314159 A1;
   (viii) Document G: License Agreement;
   (ix) 2 X duplicate copies of the claims of Document A; and
   (x) 2 X duplicate copies of Document G.

4. Prior to the hand out of the answer papers, candidates will have the opportunity to read the above documents for 60 minutes.

5. Where appropriate reference should be made to case law.

6. Please note that in the marking of answers:
   30% of the marks will be allocated for advice on legal aspects;
   60% the application of legal principles to the specific question with regard to the technical aspects of the invention and prior art; and
   10% for form of the advice.

7. The duplicate copies are for use in presenting your answers in the answer booklet provided. Use of the duplicate copies is optional. If the duplicate copies are used please clearly indicate your student number on each page of the copies used and firmly attach the copies to your answer booklet.

QUESTION 1 (50 marks)

You received the following letter from our client. Please advise your client accordingly.

"Dear Patent Attorney

I refer to your previous advice regarding South African Patent No. 2010/3001 (Document A) in the name of Sport Equipment Inc. You previously advised that according to the Patent Office records the patent is in force and all formalities regarding the application have been correctly complied with.

As you also know, we intend to manufacture a snowboard with dampers at our wood lamination plant in Boksburg. The snowboards will be mainly for export to South America and New Zealand where Sport Equipment does not have any patent rights. We expect that a small number of units might be sold locally to training centres and in Lesotho.

After your last advice that the snowboard which we intend to manufacture and the dampers we intend to use are likely to infringe claims 1 to 5 of the patent, we have searched for documents which describe or show snowboards and dampers which are similar to the ones which we intend to manufacture. In this regard, we attach the following documents:

1. *An excerpt of an internet blog by Mr Sam Cauliscrest (Document B);*
2. *An article entitled "Recent Results on snowboard oscillation modes" (Document C);*
3. *European Patent No. EP 2 001 836 A1 (Document D);*
4. *US Patent No. 6,001,618 A (Document E); and*
5. *European Patent No. EP 2 314 159 A1 (Document F).*

As we understand, these documents would be relevant to the validity of the South African patent.

The blog is authored by a well-known snowboard designer, Mr Sam Cauliscrest and the content of the blog entry of 18 September 2010 consists of paragraphs 1 to 10 and figures 1 and 2 of the document.

One of our employees, Ms Denis Simonds loves snowboarding and is a regular reader of Mr Cauliscrest's blog. She remembers that the blog entry of 18 September 2010 was indeed posted on that day. She is prepared to confirm this as a witness. She also told us that she remembers that Mr Cauliscrest already presented the content of the blog entry in an oral presentation at the public trade fair "Skip, Hop & Jump" in Davos in September 2009.

Please let us have your detailed opinion on the validity of the South African patent in light of the disclosures in the above five documents.

Yours sincerely
SA LAMINATION MANUFACTURES (PTY) LTD"

(50 marks)

QUESTION 2 (30 marks)

Provide your client with strategic advise on available options for your client in light of your advice above, what reactions could be expected from Sport Equipment Inc. and highlight the various risks which your client would face in respect of the available options. Provide your client with a final recommendation with reasons therefore.

(30 marks)

QUESTION 3 (20 marks)

You receive the below letter from you client. Advise your client accordingly.

"*Dear Patent Attorney*

Over the last few months, we, Nationwide Retailers (Pty) Ltd, have been involved in negotiations with ABC Plastics Products Inc., a US corporation which designs, manufactures and sells plastic containers worldwide. ABC does not have any presence in South Africa and is prepared to grant us the right to manufacture and sell ABC's top selling two products in South Africa. The deal is a major boost for Nationwide and we cannot afford to let it slip away.

ABC's major competitor (which is also one of our major competitors in South Africa) is Tupperware International Inc. which sells products which are similar to those of ABC. It is also important for ABC that the quality and pricing of their products are consistent worldwide.

ABC has a number of patents for its products in the USA, Europe and some other English speaking countries. For various reasons, ABC never applied for any patent protection in China, South America and most countries in Africa.

Fortunately, ABC has a patent on one of their products in South Africa and is also prepared to grant us a license under the patent.

We also require ABC's assistance and technology to successfully manufacture the products in South Africa.

We have just received the attached license agreement from ABC. Although we have little difficulty with most of the provisions, we are concerned about the proposed term of the agreement, the licensee's undertakings and warranties in clause 5 and the confidentiality undertaking in clause 13.

Kindly review the agreement and these clauses specifically for compliance to South Africa law and practice.

Please suggest amendments to any provisions which might be unlawful, or contrary to South African practice.

Kind regards
Nationwide Retainers (Pty) Ltd"

(20 marks)

- End -

DOCUMENT A

South African Patent No. 2010/3001

Priority:	**US 10/545, 717**
	15 October 2009
SA complete filing date:	**4 October 2010**
Publication and grant date:	**28 May 2014**
Patentee:	**Sport Equipment Inc.**
International classification:	**A 63 C**
	F 16 F
	H CI L

[0001] Snowboards and skis are sports articles used for gliding on snow. Both have an elongate body on which a user rides in a standing position. A snowboard differs from a ski in that it has a wider body on which both feet of the user may be attached.

[0002] Figure 1 shows a known snowboard 10. Figures 2 and 3 are reference figures. Figures 4 and 5, respectively, show a snowboard 20 and a damper 30 according to the invention.

[0003] Figure 1 shows a known snowboard 10 in a reference system as typically used by snowboard designers. A body 11 extends lengthwise along a longitudinal axis X from a nose 12 to a tail 13. Orthogonally to this longitudinal axis X, the body 11 extends widthwise in a transverse direction Y. The thickness of the body 11 is much smaller than its length and width.

[0004] Typically, the flat structure of body 11 has a constant thickness but is slightly bent lengthwise to provide elasticity to the snowboard. The thickness of the body 11 has up to now not been a design parameter in prior art snowboards.

[0005] A snowboard usually has a laminated structure of several layers of constant thickness. They comprise a core 14, typically made of foam or laminated wood, and at least one lower layer 15 below the core and at least one upper layer 16 above the core. A core may be partially or completely enclosed.

[0006] The known snowboard 10 of figure 1 is a freestyle snowboard. It is generally known that a freestyle snowboard has a nose 12 and a tail 13 which are both bent upwards, away from the ground. This enables bidirectional use of the freestyle snowboard which is important for landing safely after acrobatic manoeuvres. Unidirectional snowboards (not shown but also well known) have only the nose bent upwards and a flat, unbent tail. The latter cannot be used for acrobatic manoeuvres but are instead for racing downhill.

[0007] All snowboards suffer from chatter. Chatter is an oscillation that appears while the snowboard travels and leads to sections of the snowboard's edges moving up and down repeatedly. This is annoying for a rider and renders the snowboard unstable.

[0008] Chatter is caused, in any kind of snowboard, by unwanted oscillation modes. These are periodical deformations and are either longitudinal modes or torsional modes. Longitudinal modes behave like waves along the longitudinal axis X (figure 2 shows two such modes). Torsional modes behave with a periodic twisting motion which transversely distorts the snowboard's shape around the longitudinal axis X (figure 3 shows two such modes). Conventionally, chatter is reduced with strips of viscoelastic material laminated within the snowboard's body. This dampens the unwanted oscillation modes to some extent.

[0009] The present invention provides a snowboard with a core having a thickness which varies lengthwise. One of the advantages of such a core is better adaptation of the snowboard to the anatomy of a user standing on it. Adaptation to the anatomy of a user's legs, improves ergonomics, which is one aim of this invention. The inventors have further found that conventional damping is insufficient against chatter if the core has a lengthwise varying thickness. Better reduction of chatter is therefore another aim of this invention.

[0010] The invention uses dampers comprising piezoelectric material and at least one electronic component. Such dampers can focus the damping on specific unwanted oscillation modes, because piezoelectric material can convert mechanical stress into electrical current and vice versa.

[0011] According to an aspect of the invention, a damper may provide focussed damping by being placed at a location of high mechanical stress from an unwanted oscillation mode. In another aspect a damper may also provide focussed damping by means of an electronic component that is frequency-selective for the specific resonant frequency of the unwanted oscillation mode. Each of these approaches reduces chatter in a snowboard having a core of lengthwise varying thickness better than viscoelastic dampers.

[0012] Figure 4 shows a snowboard 20 according to the invention having an elongate body 17 with a core 18 whose thickness varies along the longitudinal axis X. The dampers 19 are placed at positions of high mechanical stress from torsional modes (cf. figure 3) and thereby provide focussed damping.

[0013] In the invention, the piezoelectric material is formed into one or more flat pieces. As used herein, a flat piece has a small thickness and can extend in surface in the two other dimensions. A preferred piezoelectric material is P27, which has excellent piezoelectric properties. It is usually formed into a monolithic platelet, this being an example of a flat piece.

[0014] A damper used in the invention is particularly effective for damping torsional modes in freestyle or unidirectional snowboards with a core of lengthwise varying thickness if it comprises P27 formed into at least one flat piece. However, P27 is brittle. A monolithic platelet of P27 which is large enough to cover the area necessary to provide sufficient damping has a high risk of breaking.

[0015] Figure 5 shows a damper 30 with a plurality of smaller flat pieces 31, 33 of P27 arranged side-by-side in a single layer and electrically connected by wires 37. This reduces the risk of breaking and thereby improves the reliability of the damper. Advantageously, a first flat piece 31 is used for sensing oscillations, while one or more second flat pieces 33 impart damping. In addition, the damper 30 comprises an electronic component 35.

[0016] The electronic component may be an integrated circuit. It may also be frequency-selective for frequencies between 30 and 80 Hz, meaning that it allows only frequencies between 30 and 80 Hz to pass through. This improves reduction of chatter because damping is focussed on the unwanted oscillation modes in this frequency range. In snowboards these are the torsional modes of figure 3.

[0017] Instead of monolithic platelets, the damper may use fibres of a piezoelectric material suitable for having fibres spun therefrom. Such fibres, e.g. made of piezoelectric PGGB, are suitably embedded in a matrix, e.g. a flexible polymer resin. Such a composite is not brittle. Shaped as a thin film, this composite can cover the area necessary to provide sufficient damping as a single flat piece which has a much reduced risk of breaking. This is very advantageous for freestyle snowboards.

[0018] To provide effective damping it is proposed to identify by measurement on an undampened snowboard locations of peak amplitude for the principal torsional mode. Based on this information, a position of high mechanical stress is calculated at which the damper 19 is then mounted. This inventive concept saves time because it is not necessary to repeatedly mount the damper to find out whether it is in the right position.

Claims

1. A sports article (20) comprising

- an elongate body (17) having a core (18), wherein the thickness of the core (18) varies along the longitudinal axis (X) of the elongate body; and
- at least one damper (19), said damper comprising piezoelectric material and an electronic component.

2. A sports article according to claim 1, the sports article being a unidirectional snowboard, wherein said damper

- comprises said piezoelectric material formed into at least one flat piece, and
- is arranged on the elongate body so as to dampen torsional modes of the sports article.

3. A sports article according to claim 1, the sports article being a freestyle snowboard, wherein said damper (19) comprises a composite of a matrix and fibres of said piezoelectric material.

4. A sports article according to claim 2 or claim 3, the piezoelectric material comprising P27.

5. A damper (30) for frequency-selective damping of oscillation modes in a sports article, the damper including:

- a first flat piece (31) of piezoelectric material for sensing oscillation modes,
- a second flat piece (33) of piezoelectric material for imparting damping, and
- an integrated circuit (35) electrically connected to said flat pieces, said integrated circuit (35) being frequency-selective for frequencies between 30 and 80 Hz.

6. A method for obtaining a sports article in which torsional modes are damped, the method comprising:

- providing an elongate body (17) having a core (18), wherein the thickness of the core (18) varies along the longitudinal axis (X) of the elongate body,
- providing at least one damper (19), said damper comprising piezoelectric material and an electronic component,
- selecting a position for said damper (19) by measuring, without the mounted damper, the amplitude of a torsional mode of said elongate body (17) at a plurality of locations, and
- mounting the damper (19) at said position.

Fig. 1

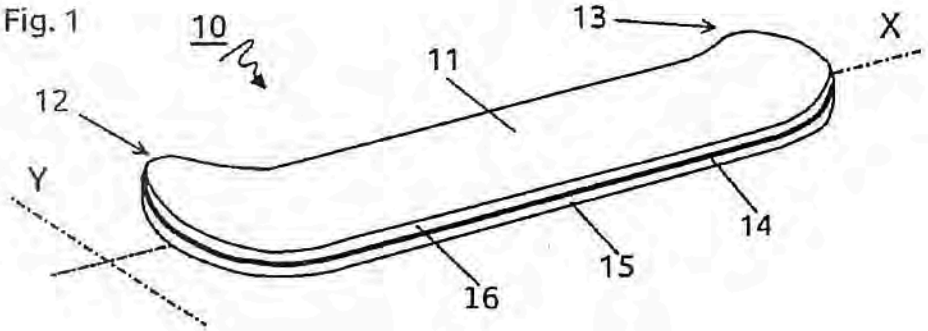


Fig. 2

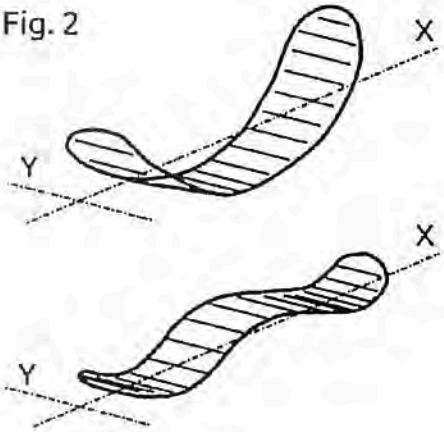


Fig. 3

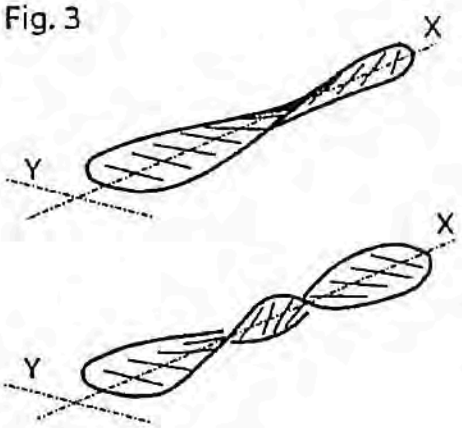


Fig. 4

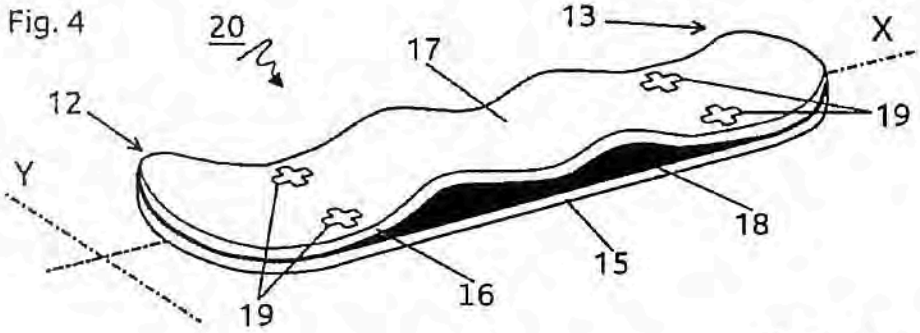
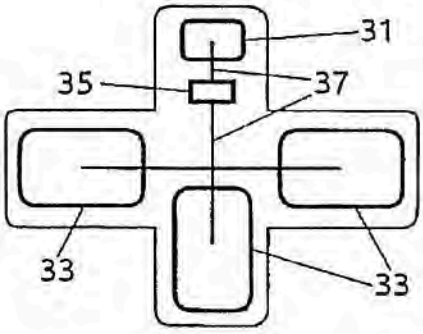


Fig. 5



http://blog.snowclonecorp.com/2010_September_18

Printed 22 February 2015

Snowclone Corp. Internet Blog by Sam Cauliscrest

Our boards make the difference

Internet blog entry of 18 September 2010, last modified on 18 September 2010

[0001] Using a computer, our researchers have numerically modelled a snowboard as transverse "slices", i.e. cross-sections at small increments along its longitudinal axis. The height of each slice was then optimised to improve the turning properties of the snowboard.

[0002] The graph in figure 1 shows the outcome of an optimisation run on the computer. The optimised height of each slice along the longitudinal axis P of the snowboard leads to a distribution curve of optimal thickness T. In the foot mounting zones 41 and 43 the optimal thickness is greater than in centre zone 42.

[0003] We built a prototype based on the design of one of our standard freestyle snowboards. Figure 2 is a schematic side view of the prototype with the thickness somewhat exaggerated. The prototype's core is not shown, but was machined so that the snowboard varies in thickness according to figure 1.

[0004] The prototype was then tested under realistic conditions on a slope and was found to have much improved turning properties. However, in these field tests we have also found that this prototype was more prone to chatter (the well-known undesired vibrations in snowboards).

[0005] Traditional dampers would have made the snowboard feel too sluggish, so we developed a new damper. It absorbs chatter almost completely without making the snowboard feel sluggish, if placed at the right spot. Near this "sweet spot" our damper will optimally absorb the energy of the periodic twisting motions which are mostly to blame for chatter.

[0006] The sweet spot is different for each type of snowboard. It can be found by trial-and-error, i.e. repeatedly positioning the damper and determining how good the damping is. This is time consuming, so it would be desirable to have a quicker way of finding, or at least approximating, the sweet spot. One could then have mobile "snowboard clinics" near ski resorts where dampers can be mounted on existing snowboards.

[0007] Our new dampers are patches embedding monolithic platelets of the piezoelectric material P27. With these patches mounted near the sweet spot of the prototype, chatter disappeared almost completely.

[0008] The new dampers are still somewhat experimental. To cover an area large enough for use on a snowboard several small monolithic platelets and electronic components are embedded in the patch.

[0009] We expect soon to have improved the patches to be reliable enough for our next line of snowboards.

[0010] Our next line of skis is also making progress. However, everybody knows that skis are not snowboards so this is off-topic in this blog.

Comment added by user flexboard@snouboadbreddl.com on 17 October 2010

[0011] Hey Sam, when will your patches come out? Patches, patches, everywhere - I just heard that Kaytwo-Corp will soon sell damping patches with composites of piezoelectric fibres in a polymer resin. I'd love to compare them with your patches with monolithic platelets of P27.

Answer by Sam Cauliscrest on 19 October 2010

[0012] We do not have a release date for our patches yet, but if you sign up to become one of our testers I can send you a sample.

Figure 1

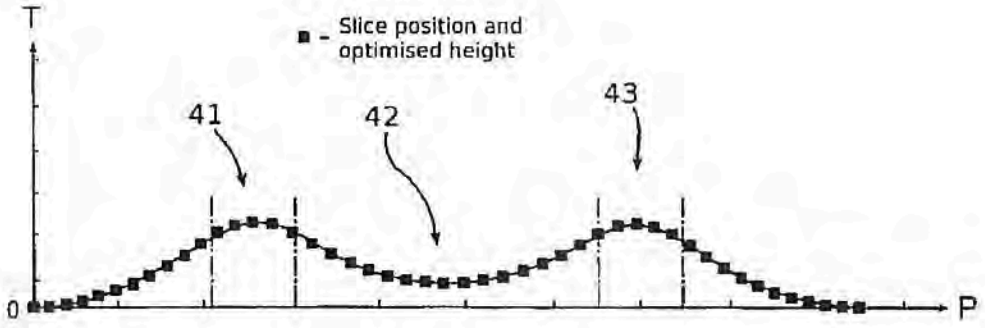
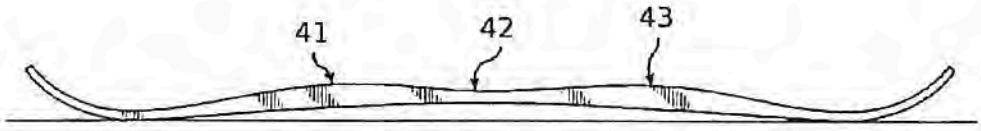


Figure 2



Steigen & Bergen, Journal of Managing Risk and Fun, Vol. 17, page 240 ff.

Recent results on snowboard oscillation modes

Jeffrey D. Bigg, Lebow Skis Labs & Hick K. Naflinger, Snowcrash Labs

Article received 5 January 2008; published 4 June 2009

DOI: 10.1139/p04-010

[0001] Current research aims to improve ergonomics and control of snowboards so that users can ride comfortably and safely at higher speeds. Control at higher speeds is compromised by chatter. In this paper we report on studying and damping unwanted oscillation modes responsible for chatter.

[0002] We have performed computer simulations with a numerical model of a snowboard. The simulation results indicate that chatter is not caused by longitudinal modes, which in snowboards have frequencies between 10 to 25 Hz, but instead by torsional modes, which in snowboards have frequencies between 30 to 80 Hz.

[0003] These torsional modes create several regions of high mechanical stress in the snowboard. Figure 1 shows part of a snowboard overlayed with a plot of simulation results, in which darker hatching signifies regions of higher mechanical stress. The results indicate that the torsional modes cause high mechanical stress in certain regions close to the edges, on the left and right sides of the snowboard.

[0004] We investigated the simulation results experimentally. A real snowboard of the unidirectional type with constant thickness and standard shape was held in a laboratory rack. We provoked the torsional modes and studied them using couplers for mechanical stress comprising the piezoelectric material P27, in the form of a monolithic platelet 55 as shown in figure 2. These couplers were very effective in our test setup, but the size of each monolithic platelet had to be kept rather small to prevent breaking.

[0005] In a first setup, the couplers were used as sensors. By iterating their location on the snowboard, we mapped the distribution of mechanical stress resulting from the torsional modes. We found the peaks of the distribution of mechanical stress at locations 58 shown in figure 3. Locations 58 of highest mechanical stress correspond exactly to the regions of highest mechanical stress in figure 1. This confirms the simulation results.

[0006] In a second, separate setup, the couplers were combined with a simple dissipative electronic circuit to form basic dampers. The components of such a circuit are not frequency selective and may couple to unwanted oscillation modes at any frequency. The coupling strength is only dependent on the location on the snowboard. We found that these basic dampers achieved considerable damping of the torsional modes and thus reduction of chatter when placed exactly at the locations 58 of highest mechanical stress.

[0007] The experimental setups were very basic, leaving room for future improvements.

[0008] In the first setup the couplers would have provided a better signal in combination with frequency filtering allowing only frequencies between 30 and 80 Hz to pass through. With this frequency filtering, the setup would have coupled better to the torsional modes causing chatter, which would have improved the relative signal strength for mapping the distribution of mechanical stress.

[0009] Our second setup of using couplers as dampers indicates a potential for improving control for riding safely at higher speeds. This could be complemented by any other concept aimed at improving the riding experience at higher speeds.

[0010] As a side result of the first setup we discovered an approximation technique for approximating the locations 58 of highest mechanical stress. This discovery was made, while provoking the torsional modes in the snowboard. We measured the undampened amplitude of the periodic twisting motion along the snowboard edge and determined the position 57 of peak amplitude (cf. figure 3). We found that locations 58 of highest mechanical stress are about halfway along the edge between this position 57 of peak amplitude and the tip 59 of the snowboard.

[0011] This technique, later confirmed on other snowboards, gives a quickly obtainable approximation if the locations 58 of highest mechanical stress are not exactly known. However, the basic dampers of our second setup were not compatible with this approximation technique because they had to be placed exactly at said locations 58 of highest mechanical stress.

Figure 1

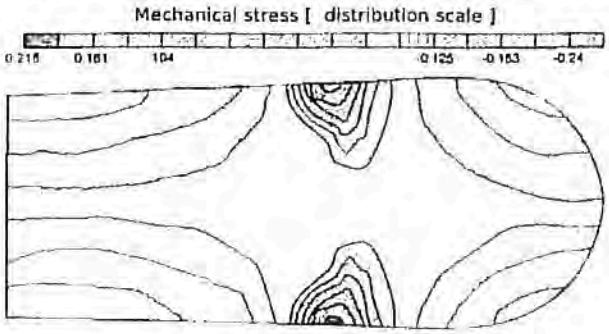


Figure 2

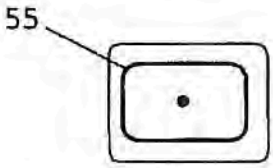
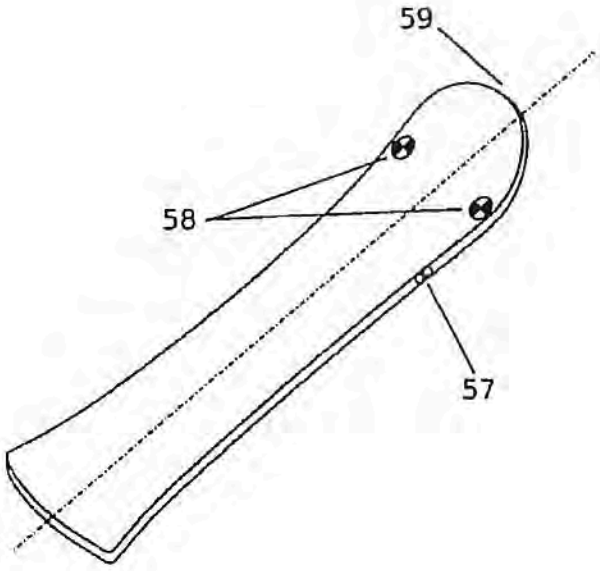


Figure 3



(19) **European Patent Office**

(12) **European Patent Application**

(21) Application number: **08 02 71 82.8**

(11) Publication number: **EP 2 001 836 A1**

(22) Date of filing: **8 January 2007**

(30) Priority: **9 January 2006 DE 102037183088**

(43) Date of publication: **8 June 2007**

(51) Int. Cl.: **B63B35/73, A63C5/04**

(71) Applicant: **Rystoff Brettl KG**

(72) Inventor: **Puristsaf T. Fastsirup, Wasita C. Atisaw**

(84) Designated Contracting states: **AT BE GB HU IS LU LV**

Ergonomic sportsboard

[0001] Conventional sportsboard constructions have a flat upper surface on which a user's body adopts a position which is comfortable for a ride at low speed. However, when riding at higher speeds, this position can lead to accelerated wear on the hips, knees and ankles, because the user has to quickly react to sudden movements of the sportsboard. Accordingly, there is a need for an improved sportsboard which reduces wear on a user and allows riding comfortably also at higher speeds.

[0002] Figure 1 shows a user standing on an ergonomic sportsboard of the invention. A lower surface of the sportsboard is generally for contact with a medium (e.g. water) and an upper surface forms an interface for the user's feet at mounting sections 61 and 62.

[0003] The upper surface is curved at mounting sections 61 and 62. Because of this curvature the user's feet pivot inwardly toward the centre of the sportsboard. Thus, the legs assume a better anatomical position and the ergonomics for the user are improved.

[0004] The structure providing the curvature of the upper surface preferably is the core of the sportsboard. The resulting sportsboard is strong and solid, because the core typically extends from one end of the sportsboard to the other.

[0005] Figure 2 shows such a core 63 in a perspective view of a length-wise and cross-wise cut through the sportsboard of figure 1 at mounting section 62. The core 63 is sandwiched between lower and upper surface layers 64 and 65. Note the locally increasing height W of the core 63. This results in the upper surface layer 65 being curved.

[0006] Because of the curved upper surface the sportsboard according to the invention is better adapted to the anatomy of its user and also more comfortable when being ridden at higher speeds.

[0007] Other structures may provide the same effect and are likewise part of the present invention. For instance, a moulded platform may be attached with an adhesive to the upper surface of a previously manufactured flat sportsboard.

[0008] The present invention is equally applicable to improve the ergonomics of any sports article ridden in a standing position (e.g., surfboards, water skis) or kneeling position (e.g., wakeboards).

Claim:

A sportsboard having a body with increased thickness at a mounting section (61, 62) and a decreased thickness outside said mounting section (61, 62).

Figure 1

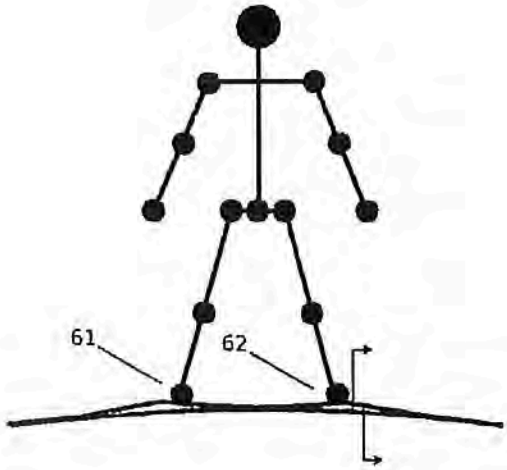
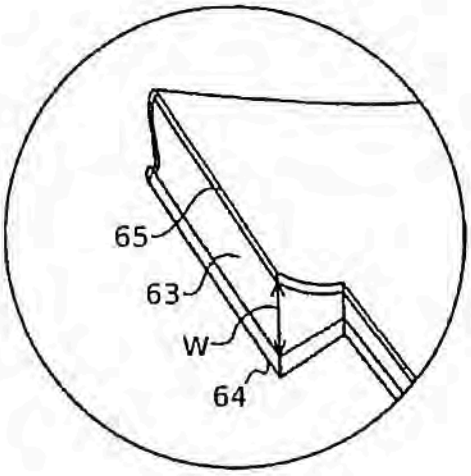


Figure 2



(19) United States Patent

(11) Patent number:	**US 6,001,618**
(45) Date of patent:	**June 5, 2000**
(51) Int. Cl.:	**A63C5/075, F16F15/00**
(21) Application number:	**23/995,140**
(22) Filed:	**July 6, 1998**
(71) Assignee:	**Oehren Ski Samfundet**
(72) Inventors:	**Gohan G. Asalami, A. Rozalabad**

(54) Electronic system for improving control of snow skis

[0001] User control of snow skis can be reduced due to chatter caused by unwanted oscillation modes. Longitudinal modes are the only type of unwanted oscillation modes occurring in such skis because of their long and narrow shape.

[0002] Figure 1 illustrates a ski 70 according to the invention. A shovel 72 prevents the front of the ski 70 from digging into the snow. Extending along its longitudinal axis 79, the ski 70 narrows to a waist 74 and then widens into a tail 73. Ski 70 includes an electronic system 80 mounted centrally along the longitudinal axis 79 in a manner to couple to the longitudinal modes of the ski 70.

[0003] The inner structure of the ski 70 is not shown but contains a core. The core is thinner at the shovel 72 and tail 73 and thicker at the waist 74 to facilitate turning on snow. Means 75 for attaching one foot of a user may be conveniently placed at waist 74.

[0004] As shown in more detail in figure 2, the electronic system 80 comprises a plurality of monolithic platelets 83 of piezoelectric material and a control circuit 85. The monolithic platelets 83 are electrically connected to the control circuit 85 via wiring traces 87.

[0005] A sensor 88 detects any unwanted oscillation mode and sends a corresponding signal to the control circuit 85. The control circuit 85 then uses an energy source, e.g. a battery (not shown), to send a counteracting electrical signal to the wiring traces 87. This signal causes the material of the monolithic platelets 83 to deform or resist deformation in such a way that the electronic system 80 dampens the unwanted oscillation mode.

[0006] The control circuit may be an integrated circuit mounted onto the sensor. Preferably, one of the monolithic platelets is used as the sensor. Then the electronic system is very compact and could also be easily attached after manufacture of the ski. It could also be attached to other types of sports equipment or sold separately.

[0007] The control circuit may include a microcontroller which is frequency-selective for a frequency range of 10 to 25 Hz. Thereby the electronic system couples principally to the frequencies of the dominant longitudinal modes. If necessary, the microcontroller can also be modified to be frequency-selective for a different frequency range.

[0008] Such a microcontroller may be implemented as part of said integrated circuit. The integrated circuit may also contain a memory which stores data generated by the sensor for downloading after skiing.

What is claimed:

1. A ski (70) for use on snow, comprising an electronic system (80) with piezoelectric material coupled to the ski so as to flex when the ski flexes.

Figure 1

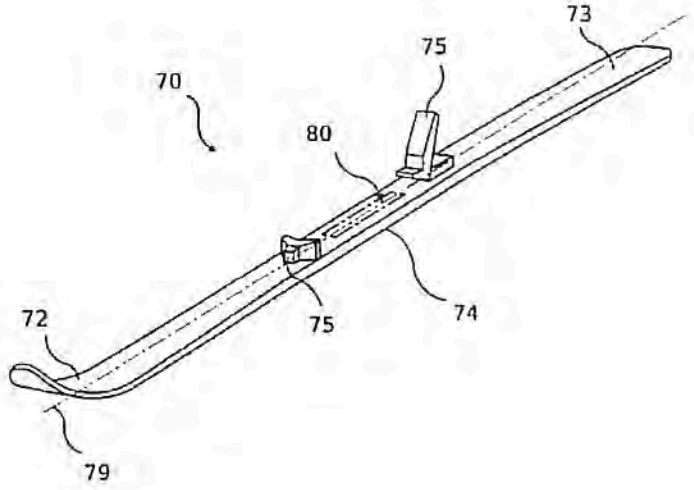
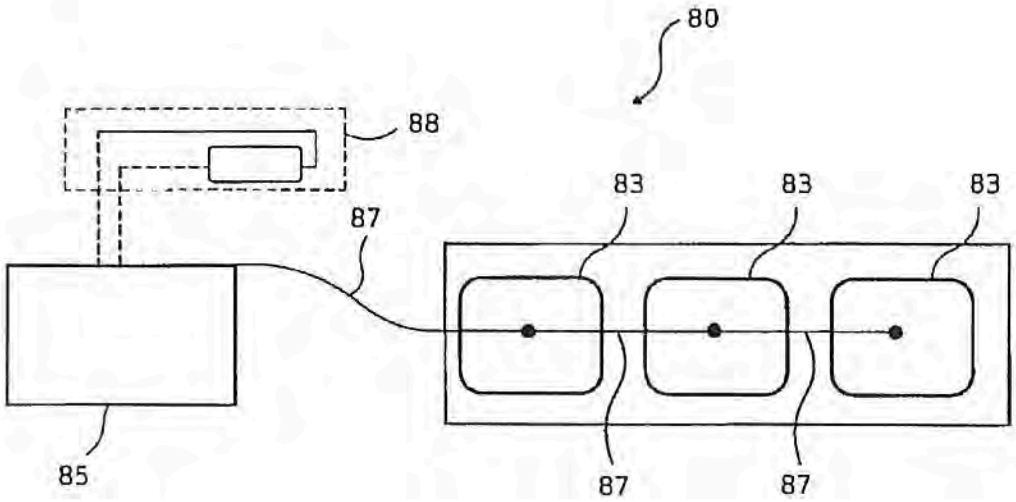


Figure 2



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(71) Applicant:	**Ames Sheets Inc.**
(72) Inventor:	**N. Radd, J. Cornelius, A. Calfeutrail**
(84) Designated Contracting states:	**AL BE IS NO RO SE**

Flexible piezoelectric films

[0001] Piezoelectric material in crystalline form, as used in known dampers, is difficult to attach to curved surfaces. It is usually also brittle and cannot withstand too much bending, otherwise it breaks.

[0002] This invention overcomes these problems with a flexible piezoelectric film.

[0003] Figure 1 illustrates the method according to the invention. A block 100 is provided; it is made of RZCH, a piezoelectric material that has been found to work with the method according to the invention. The material is transformed into fibres 110 which are aligned and then embedded in a polymer resin 120 having suitable flexibility after curing. Moulding and curing then provides a piezoelectric film 130 of a desired shape and flexibility. A usable flexible piezoelectric film 140 is obtained after further treatment, such as trimming excess resin to permit an electrical connection.

[0004] The following example illustrates the broad range of applications of the invention.

[0005] Figure 2 shows a golf club using dampers with the flexible piezoelectric film of the invention. The golf club includes an elongated shaft 92, at least part of which is mounted inside a grip 95. The shaft is a tube whose core may be filled with suitable material. The tube has a constant wall thickness, but its outer and inner diameter taper from a larger width needed to mount the grip 95 to a smaller width to connect to a head 96.

[0006] Dampers 97a, 97b, and 97c each comprise the flexible piezoelectric film in the shape of a thin strip attached onto the surface of the club. Using the flexible piezoelectric film, the dampers dampen undesired vibrations of the golf club.

[0007] Preferably, the dampers 97a, 97b, and 97c are obtained with a single curing step by which the flexible piezoelectric film embeds circuitry necessary to obtain sufficient damping. The circuitry may comprise an integrated circuit to provide a pass-band filter for the frequencies of undesired vibrations.

[0008] Such dampers can be adapted also for sports other than golf. The flexible piezoelectric films can be attached onto uneven or large surfaces, so that undesired vibrations of many other well-known types of sports articles can be damped, such as tennis racquets, skis or snowboards.

[0009] The flexible piezoelectric films may also be used instead of multiple wire-connected monolithic platelets in traditional dampers with piezoelectric material. Dampers with the flexible piezoelectric films have fewer components, are less complex to manufacture, and are more reliable.

Claim:

A method of making a flexible piezoelectric film comprising: transforming a piezoelectric material to fibres; embedding the fibres, and optionally further components, in a resin.

Figure 1

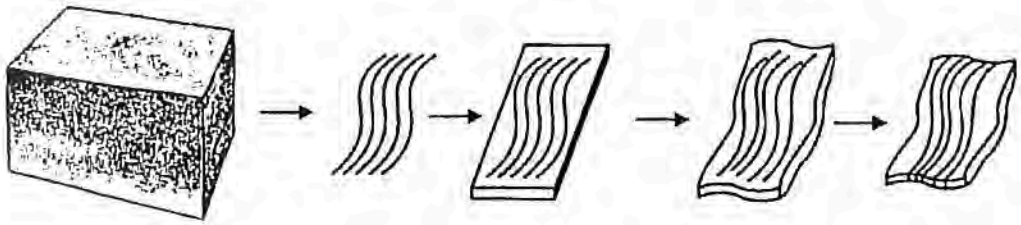
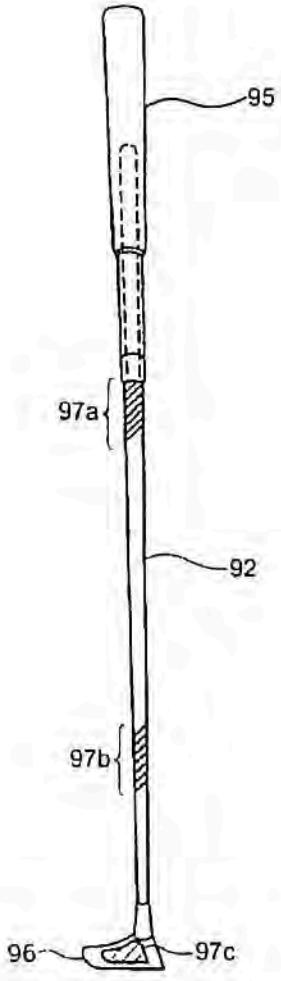


Figure 2



Document G

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2. The Licensor is the proprietor of designs and specifications (the "**Know-how**") for the manufacture of:

   2.1. plastics container and lid combinations allowing sealing of the lid on the container to provide an airtight sealed combination (the "**First Product**"); and

   2.2. plastics container and lid combinations allowing sealing of the lid on the container to provide an airtight sealed combination and the extraction of excess air from the sealed combination (the "**Second Product**"), which Second Product falls within the scope of the claims of the Patent.

   (the First and the Second Products are jointly herein referred to as the "**Products**")

3. This license agreement shall come into force on the **[insert date]** of November 2015 (the "**Effective Date**") and shall continue until expiry of 25 (twenty five) years or until terminated in accordance with the provisions hereinafter contained, whichever is first (the "**Term**").

4. The Licensor herewith grants to Nationwide Retailer (Pty) Ltd, having its registered office at Block C, Sandown Office Park, 8 Impala Road, Sandown, Gauteng, South Africa (the "**Licensee**") from the Effective Date and for the Term the non-exclusive right to manufacture, package, market, sell and distribute the Products under the Patent in South Africa only ("the Territory").

5. The Licensee undertakes to and warrants that:

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5.2 It shall during the Term assist The Licensor in and take all reasonable steps that may be necessary to secure and protect the rights in the Patent in the Territory and in accordance with the directions of The Licensor;

5.3 It shall not manufacture, package, market, distribute, sell or export any of the Products in or to any country or territory outside the Territory unless with the written consent of The Licensor;

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5.5 It shall grant The Licensor full and unrestricted access during normal business hours to inspect any of The Licensee' manufacturing facilities and operations where any Products will be or is manufactured;

5.6 It shall not and shall not cause any other party to, engage, directly or indirectly, in the Territory, in the manufacture, sale, distribution, import or export of products competitive with or similar to the Products;

5.7 It shall not purchase or import into the Territory any products competitive with or similar to any of the Products;

5.8 It shall diligently and continuously market, manufacture and distribute the Products throughout the Territory throughout the Term;

5.9 It shall affix to the Products and it's packaging the mark "Manufactured under license from ABC Plastics Products (Pty) Ltd under SA Patent No. 2013/0251";

5.10 It shall not manufacture, package, market, sell or distribute any product of Tupperware International Inc; and

5.11 It shall sell the Products at the retail price and shall not provide any discounts on the sale of any of the Products in excess of a maximum discount, as advised by the Licensor from time to time.

6. The Licensee shall, within 30 (thirty) days of the end of each three month cycle after the Effective Date, in arrears, pay The Licensor a royalty on all sales of the Products during the relevant preceding three month period. The royalty shall be based on 5% (five percent) of the invoiced net sales price of each Products which The Licensee sells on an arm's length basis exclusive of VAT or any tax imposed on such sales by a competent authority.

7. The Licensee shall keep full, true and accurate books of account and records in accordance with generally accepted accounting practice containing all particulars that may be necessary for the purposes of showing the amount of royalties payable to The Licensor in terms of this license agreement. Such books of account and records shall be kept at the premises where The Licensee' business is carried on. The Licensee shall permit The Licensor at any time during business hours to have an independent chartered accountant of The Licensor' selection and at The Licensor' costs examine all of the aforementioned books of account and records (including information stored in computer readable form) and to take copies of all such documents, books and records to determine whether all appropriate accounting of royalties hereunder and payments thereof have been made.

8. This license agreement shall not be construed as constituting the parties as partners or agents of one another for any purpose whatsoever.

9. The rights and obligations of The Licensee are personal and The Licensee shall not be entitled to cede, assign or transfer its rights and obligations under this license agreement to any third party.

10. Either party shall have the right to terminate this license agreement by giving at least 3 (three) month's written notice to the other party provided that no such

notice of termination may be given by either party within the first 12 (twelve) months from the Effective Date.

11. Without prejudice to any party's rights in common law or under this license agreement an innocent party shall have the right at any time by giving written notice to the defaulting party to terminate the agreement forthwith in any of the following events:

    11.1. if the defaulting party commits any breach of any term or condition of this license agreement; and

    11.2. If defaulting party enters into liquidation whether compulsorily or voluntarily (otherwise than for the purposes of amalgamation or reconstruction) or compounds with its creditors or takes or suffers any similar action in consequence of debt.

12. The Licensee acknowledges that all rights, title and interest in and to the Patent vest in The Licensor, and save for the rights afforded in terms of this license agreement, The Licensee has no claim of any nature in and to the Patent. The Licensee undertakes not to attack or dispute, or assist any other party to attack or dispute, any rights which The Licensor may claim under the Patent.

13. All Information disclosed by the Licensor to the Licensee under this agreement which, by its nature, is confidential or proprietary, including, but not limited to, information related to the Products and Know-how shall, under all circumstances, be held secret by the Licensee. The Licensee may not disclose, publish or transfer such confidential or proprietary information, may use it only for the specific purposes contemplated in this agreement, and must treat it with the same degree of care as it does with its own similar information, but with no less than reasonable care. the Licensee's obligations under this section shall survive the expiration or termination of this agreement for a period of 5 (five) years.

14. This license agreement shall be governed in all respects by the laws of the Republic of South Africa. Any dispute arising from or on connection with this license agreement shall be finally resolved in South Africa in accordance with the

Rules of the Arbitration Foundation of Southern Africa ("the Foundation") by an arbitrator appointed by the Foundation. Notwithstanding the aforegoing any party, pending finalisation of the arbitration, shall be entitled to obtain interim relief in the High Court having jurisdiction.

15. Any notice required to be given hereunder shall be given by hand or forwarded by registered post, recorded delivery service or telefax to the above address of the relevant party. Any notice sent by registered post or recorded delivery, shall be deemed to have been received 14 (fourteen) working days after such notice was sent and any notice sent by, telefax, unless proven otherwise, shall be deemed to have been received on the first working day of the recipient after such transmission. Any notice of any change of address must be given in writing by the party concerned and delivered by hand or sent by registered mail to the other party.

16. No indulgence or relaxation of rights granted by one party to the other party shall be prejudicial to or constitute a waiver of such party's rights under this license agreement or at law and any waiver of rights by a party to this license agreement shall not be construed as such unless such waiver is in writing and signed on behalf of the parties.

17. The Licensee herewith indemnifies The Licensor and undertakes to keep The Licensor indemnified against all claims of whatsoever nature, real or imagined, which may be made against The Licensor arising from the Products including but not limited to defective quality, late delivery or failure of any one of the Products in use.

18. This license agreement reflects the entire agreement between the parties and supersedes all previous agreements, undertakings or arrangements between the parties relating to the Products. This license agreement shall only be capable of being added to, subtracted from, varied, modified or consensually cancelled by a written agreement signed on behalf of the parties. The parties shall not be bound by any undertakings, representations, warranties, promises or the like not

recorded in this license agreement or made otherwise than in compliance with this provision.

19. In the event that any of the provisions of this license agreement are found to be invalid, unlawful or unenforceable, such term or clause shall be severable from the remaining terms or clauses, which shall continue to be valid and enforceable.

SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **ABC Plastics Products Inc.**

Full Name: _____

Position: _____

The signatory hereof warrants that he/she is dully authorised to enter into this Agreement on behalf of the Licensor

SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **Nationwide Retailer (Pty) Ltd**

Full Name: _____

Position: _____

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Claims

1. A sports article (20) comprising

- an elongate body (17) having a core (18), wherein the thickness of the core (18) varies along the longitudinal axis (X) of the elongate body; and
- at least one damper (19), said damper comprising piezoelectric material and an electronic component.

2. A sports article according to claim 1, the sports article being a unidirectional snowboard, wherein said damper

- comprises said piezoelectric material formed into at least one flat piece, and
- is arranged on the elongate body so as to dampen torsional modes of the sports article.

3. A sports article according to claim 1, the sports article being a freestyle snowboard, wherein said damper (19) comprises a composite of a matrix and fibres of said piezoelectric material.

4. A sports article according to claim 2 or claim 3, the piezoelectric material comprising P27.

5. A damper (30) for frequency-selective damping of oscillation modes in a sports article, the damper including:

- a first flat piece (31) of piezoelectric material for sensing oscillation modes,
- a second flat piece (33) of piezoelectric material for imparting damping, and
- an integrated circuit (35) electrically connected to said flat pieces, said integrated circuit (35) being frequency-selective for frequencies between 30 and 80 Hz.

6. A method for obtaining a sports article in which torsional modes are damped, the method comprising:

- providing an elongate body (17) having a core (18), wherein the thickness of the core (18) varies along the longitudinal axis (X) of the elongate body,
- providing at least one damper (19), said damper comprising piezoelectric material and an electronic component,
- selecting a position for said damper (19) by measuring, without the mounted damper, the amplitude of a torsional mode of said elongate body (17) at a plurality of locations, and
- mounting the damper (19) at said position.

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- selecting a position for said damper (19) by measuring, without the mounted damper, the amplitude of a torsional mode of said elongate body (17) at a plurality of locations, and
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Document G

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SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **ABC Plastics Products Inc.**

Full Name: _____

Position: _____

The signatory hereof warrants that he/she is dully authorised to enter into this Agreement on behalf of the Licensor

SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **Nationwide Retailer (Pty) Ltd**

Full Name: _____

Position: _____

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Document G

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5.7 It shall not purchase or import into the Territory any products competitive with or similar to any of the Products;

5.8 It shall diligently and continuously market, manufacture and distribute the Products throughout the Territory throughout the Term;

5.9 It shall affix to the Products and it's packaging the mark "Manufactured under license from ABC Plastics Products (Pty) Ltd under SA Patent No. 2013/0251";

5.10 It shall not manufacture, package, market, sell or distribute any product of Tupperware International Inc; and

5.11 It shall sell the Products at the retail price and shall not provide any discounts on the sale of any of the Products in excess of a maximum discount, as advised by the Licensor from time to time.

6. The Licensee shall, within 30 (thirty) days of the end of each three month cycle after the Effective Date, in arrears, pay The Licensor a royalty on all sales of the Products during the relevant preceding three month period. The royalty shall be based on 5% (five percent) of the invoiced net sales price of each Products which The Licensee sells on an arm's length basis exclusive of VAT or any tax imposed on such sales by a competent authority.

7. The Licensee shall keep full, true and accurate books of account and records in accordance with generally accepted accounting practice containing all particulars that may be necessary for the purposes of showing the amount of royalties payable to The Licensor in terms of this license agreement. Such books of account and records shall be kept at the premises where The Licensee' business is carried on. The Licensee shall permit The Licensor at any time during business hours to have an independent chartered accountant of The Licensor' selection and at The Licensor' costs examine all of the aforementioned books of account and records (including information stored in computer readable form) and to take copies of all such documents, books and records to determine whether all appropriate accounting of royalties hereunder and payments thereof have been made.

8. This license agreement shall not be construed as constituting the parties as partners or agents of one another for any purpose whatsoever.

9. The rights and obligations of The Licensee are personal and The Licensee shall not be entitled to cede, assign or transfer its rights and obligations under this license agreement to any third party.

10. Either party shall have the right to terminate this license agreement by giving at least 3 (three) month's written notice to the other party provided that no such

notice of termination may be given by either party within the first 12 (twelve) months from the Effective Date.

11. Without prejudice to any party's rights in common law or under this license agreement an innocent party shall have the right at any time by giving written notice to the defaulting party to terminate the agreement forthwith in any of the following events:

    11.1. if the defaulting party commits any breach of any term or condition of this license agreement; and

    11.2. If defaulting party enters into liquidation whether compulsorily or voluntarily (otherwise than for the purposes of amalgamation or reconstruction) or compounds with its creditors or takes or suffers any similar action in consequence of debt.

12. The Licensee acknowledges that all rights, title and interest in and to the Patent vest in The Licensor, and save for the rights afforded in terms of this license agreement, The Licensee has no claim of any nature in and to the Patent. The Licensee undertakes not to attack or dispute, or assist any other party to attack or dispute, any rights which The Licensor may claim under the Patent.

13. All Information disclosed by the Licensor to the Licensee under this agreement which, by its nature, is confidential or proprietary, including, but not limited to, information related to the Products and Know-how shall, under all circumstances, be held secret by the Licensee. The Licensee may not disclose, publish or transfer such confidential or proprietary information, may use it only for the specific purposes contemplated in this agreement, and must treat it with the same degree of care as it does with its own similar information, but with no less than reasonable care. the Licensee's obligations under this section shall survive the expiration or termination of this agreement for a period of 5 (five) years.

14. This license agreement shall be governed in all respects by the laws of the Republic of South Africa. Any dispute arising from or on connection with this license agreement shall be finally resolved in South Africa in accordance with the

Rules of the Arbitration Foundation of Southern Africa ("the Foundation") by an arbitrator appointed by the Foundation. Notwithstanding the aforegoing any party, pending finalisation of the arbitration, shall be entitled to obtain interim relief in the High Court having jurisdiction.

15. Any notice required to be given hereunder shall be given by hand or forwarded by registered post, recorded delivery service or telefax to the above address of the relevant party. Any notice sent by registered post or recorded delivery, shall be deemed to have been received 14 (fourteen) working days after such notice was sent and any notice sent by, telefax, unless proven otherwise, shall be deemed to have been received on the first working day of the recipient after such transmission. Any notice of any change of address must be given in writing by the party concerned and delivered by hand or sent by registered mail to the other party.

16. No indulgence or relaxation of rights granted by one party to the other party shall be prejudicial to or constitute a waiver of such party's rights under this license agreement or at law and any waiver of rights by a party to this license agreement shall not be construed as such unless such waiver is in writing and signed on behalf of the parties.

17. The Licensee herewith indemnifies The Licensor and undertakes to keep The Licensor indemnified against all claims of whatsoever nature, real or imagined, which may be made against The Licensor arising from the Products including but not limited to defective quality, late delivery or failure of any one of the Products in use.

18. This license agreement reflects the entire agreement between the parties and supersedes all previous agreements, undertakings or arrangements between the parties relating to the Products. This license agreement shall only be capable of being added to, subtracted from, varied, modified or consensually cancelled by a written agreement signed on behalf of the parties. The parties shall not be bound by any undertakings, representations, warranties, promises or the like not

recorded in this license agreement or made otherwise than in compliance with this provision.

19. In the event that any of the provisions of this license agreement are found to be invalid, unlawful or unenforceable, such term or clause shall be severable from the remaining terms or clauses, which shall continue to be valid and enforceable.

SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **ABC Plastics Products Inc.**

Full Name: _____

Position: _____

The signatory hereof warrants that he/she is dully authorised to enter into this Agreement on behalf of the Licensor

SIGNED at _____ on this the _____ day of _____ 2015.

AS WITNESSES:

1. _____

_____

For and on behalf of:

1. _____ **Nationwide Retailer (Pty) Ltd**

Full Name: _____

Position: _____

The signatory hereof warrants that he/she is dully authorised to enter into this Agreement on behalf of the Licensee