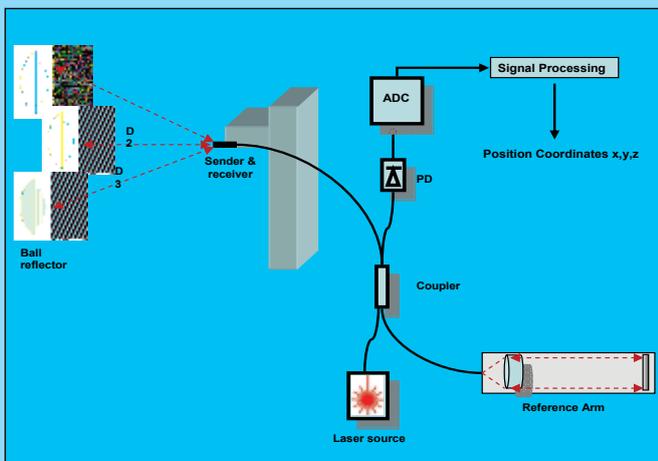


μ-GPS GmbH • Herpfer Straße 40 • D-98617 Meiningen Frau Joanna Izdebski • Regional Direktorin

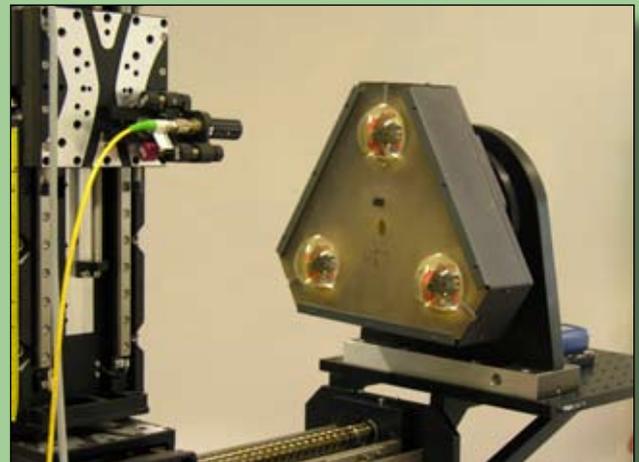
μ-GPS System provides extremely precise 3D optical measurements in the 1-5 μm range.

The principle behind such 3D measurements is similar to GPS (Global Positioning System) used to orientate in the environment. μ-GPS uses the advances made in triangulation and interferometry as basis for developing a system which allows for highly accurate positional calculations. With integrated multi-functional sensors and actuators, together with associated electronics and an adaptive control system capable of acting in real time the system provides exact positioning

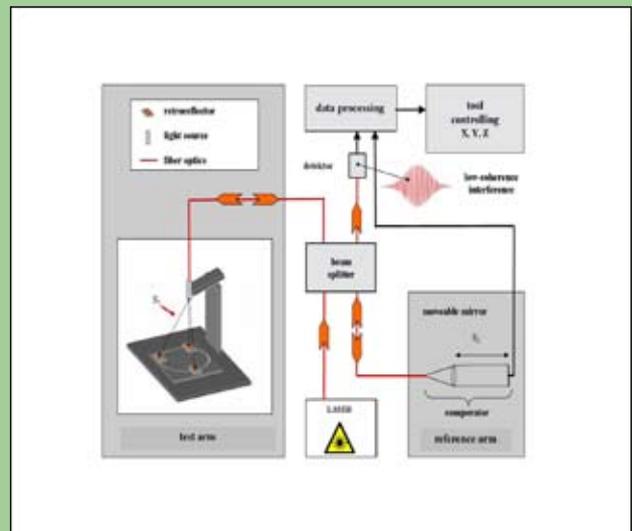


of moving parts during the machine installation processes and delivers quantitative data where demand for absolute accuracy is required.

μ-GPS Technology promises significant efficiency and reliability gains in the use of optical methods for industrial measuring methods. This quality management tool was designed for manufacturing organisations for optimizing production processes and reducing delays and in



Mess- und Versuchsanordnung



terruptions associated with the lengthy set-up times in the start-up phase. It is an integral part of manufacturing and considerably decreases costs and time required in the traditional methods.

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**DigiDruck Dormagen • Mr. Christian Dietsch
 Kölner Straße 118-120 • D-41539 Dormagen**

A Life-Saving Helmet

In recent years, various tragic accidents have happened to children playing, especially on playgrounds. For example, when playing on climbing frames, children time and again slip through openings. For this reason, the European DIN EN 1176 standard prohibits dangerous openings in playground equipment, which are big enough for a child to fit through, but imply a certain danger of the child's head getting stuck. However, this standard does not take account of the fact that children busy on a playground often refrain from taking their bike helmets off, which has given rise to cases of bike helmets getting entangled in such openings.

This resulted in some lethal cases, including such accidents, in which an affected child was initially rescued only to lapse into a lengthy coma afterwards. As a matter of course, a variety of other casualty scenarios are equally possible such as landing accidents of parachutists and artists, accidents involving bikers, fire fighters, skiers, construction workers or other persons wearing headgear for their own protection. It is the purpose of this invention to eliminate such disadvantages without the helmet becoming detached in a conventional accident situation before the head of its wearer actually suffers an impact.

To achieve this, I have availed myself of the fact that strangulation takes clearly more time than a fall or flying through the air following a collision. I have solved this problem with a time-delayed release of the chin strap, as soon as a predefined maximum force is exceeded. Further embodiments are: The strap mechanism will immediately release when impacted by a very



strong tensile force and slacken with a certain delay on exposure to tensile force of lesser intensity. Because the chin strap simultaneously disengages at several points, grazes are prevented.

Even its combined use with warning devices is already covered by patent rights. As an example, a helmet wearer can be warned that his/her head protection will no longer be available when exceeding a predefined tensile force.

Recently, a patent has been filed for more opening options especially invented for this helmet. These feature low R & D costs, high reliability, simple use and affordable manufacturing cost. While single-time release provides an economic possibility, other versions may be designed to withstand 300,000 to 500,000 changes in tensile force. Accordingly, the chin strap could resist much more mechanical stress than the helmet shell.

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**Mr. Dr. rer. nat. Manfred Möhring • Oststr. 25
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Large-Scale Wind Power Plants



The invention offers a possibility for traditional three-wing tower windmills to use vanes of extended length.

This development is distinguished by vanes supported at their distal ends, thus facilitating an ingenious extension of the vanes to as much as double their current length. The technique provides for elastic suspension and double-end pivoting for controlled rotation of each individual vane.

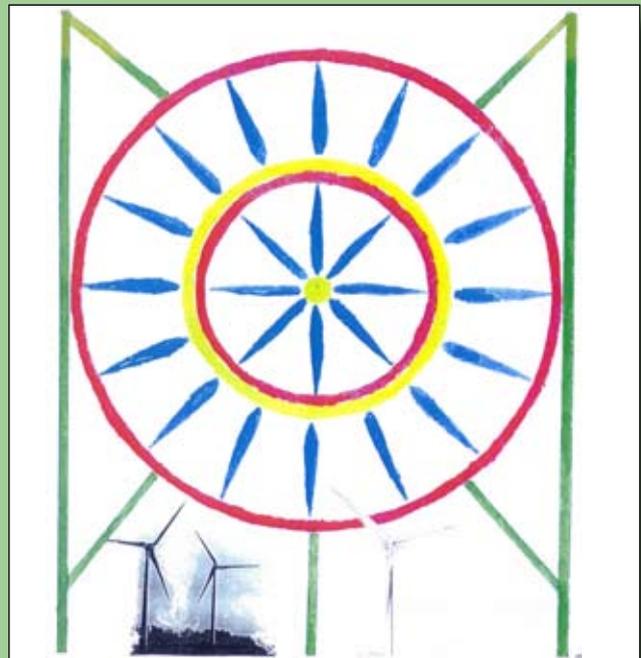
With vane lengths strongly increased, the calculation formula changes in a favourable manner, yielding disproportionately higher rates of power output, which provides an overwhelming argument in favour of this first part of the invention. A wind energy plant of this type outputs 15 MW. Traditional windmills generate 1 MW to 6 MW.

The development aims to increase the performance of tower windmills, which is currently achieved by creating large or huge wind energy parks through

a purely additive approach. This latest construction type of a windmill power plant with a ring-shaped hollow rail with roller chain allows plants of a smaller diameter to be integrated in plants of a greater diameter.

Multistage windmills of higher power can thus be created with little effort. This innovative engineering design also yields saving effects when a windmill is installed. More importantly, however, it features a favourable calculation formula for added power at a windmill plant as a whole.

The area which is covered by vane motion enters into the power calculation formula in square form. Assuming identical output power, a newly developed "multi-stage giant windmill" requires as little as one tenth or one twentieth of the efforts for a state-of-the-art wind park plant.



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Geräte- und Pumpenbau GmbH Dr. Eugen Schmidt Mr. Andreas Schmidt • Schwarzbacher Str. 28 D-98673 Merbelsrod

Pneumatically Operated Water Pump for Combustion Engines

A passenger car engine's warm-up period can be shortened to yield fuel savings from 0.5% to 3% as measured in a NEDC reference cycle.

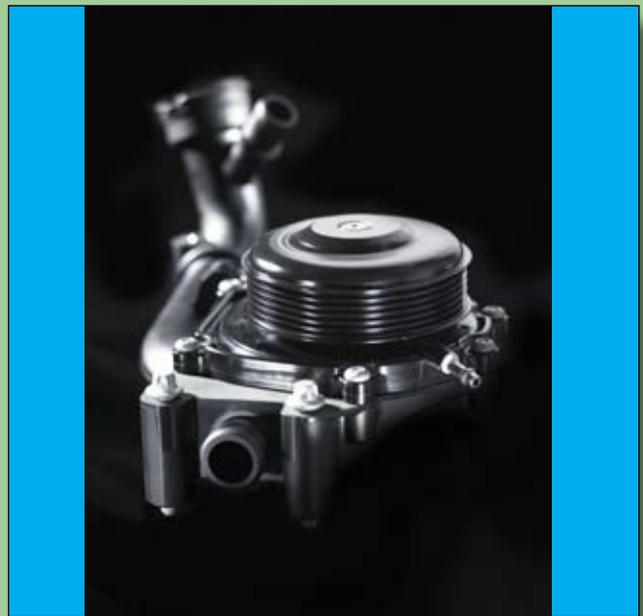
OEM's are likely to unlock this potential before long by introducing thermal management everywhere in the combustion engine industry.

A pneumatically operated water pump will be the key component in future cooling circuits to achieve this. It allows the flow of coolant to be completely shut off after a cold start, thus facilitating a rapid warm-up of the engine.

This shut-off function relies on the long established principle of an annular slide valve for operation control of rotary pumps.

GPM's patented solutions offer these advantages:

- efficient sealing of impeller wheel and bypass leakage for quickest possible engine warm-up
- considerable energy savings through zero-delivery phases
- failsafe function for guaranteed motor cooling
- reliable switching function throughout the entire engine temperature range
- same design/package space as known belt-driven water pumps
- only minor extra weight, compared to



- continuously working pump
- can also be integrated with established engine family types
- highly beneficial price-performance ratio.

The switching function is initiated by an electric change-over valve that causes negative pressure to be applied to a pump-integral rubber membrane.

A pressure differential builds up at the membrane exercising a pressure force that is transmitted to the control valve via three actuator rods, transferring the valve into closed position. As the electric change-over valve is turned off, return springs restore the slide valve to its initial position.

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GEOTEX GmbH • Andreas Neumann • Jan Holland-Moritz Untere Röde 13 • D-36466 Dermbach/Rhön

GEOTEX® Geomat

The GEOTEX® Geomat consists of a single, longitudinally coherent skein of untreated sheep's wool that is arranged in a meander-like pattern. Preferentially, the skein has a diameter of about 4 cm, with an appropriate meander-to-meander spacing of 12 cm.

Viewed in a longitudinal direction, it has five warp knit fabric links of hemp rope arranged on either side and evenly distributed over the meander width.

The link-to-link spacing has been selected in such a manner that the row-to-row skein distance will be preserved when the Geomat is laid out. Optionally, hay may be added to the sheep's-wool skein for increased nutrient substance. Grass seeds or similar plant types and starting fertilizer can also be implanted into the Geomat.

Fabrication:

No waste is created during fabrication of the Geomat from sheep's wool. Accordingly, the Geomat provides a product complying with all ecological requirements – it rots within the time that implanted seeds and/or plants require to grow and to reach a level of vegetation strong enough to safely prevent the erosion of soil with their roots.

Preferentially, the Geomat should be laid out on specially prepared level ground. For application on a slope, rotten pegs, dowels or seedlings capable of growing roots can be used in the familiar way. Optionally, although not required, the Geomat may be covered with an extra layer of soil or plants may be set for better initialization of growth.



Product benefits:

- Waterstorage capacity: Sheep's wool is able to absorb and hold rainwater at the four-fold rate of its own mass, slowly releasing it into the surrounding area, the seed stock and the roots of plants.
- Accelerated growth of plants.
- Protects soil from evaporation.
- Erosion protection: Prevents washing away of the soil constituents that have been placed between the meander rows or below the Geomat.
- Facilitates integration of plant seeds and supplementary nutrient depositaries.
- Creates favourable micro climate with temperature levelling and frost protection.
- Nutrient source: Nutrients are set free for plant growth as the wool decomposes.
- Provides excellent drainage effect and routes rainwater into available discharge facilities (canal, brook, pits, etc.).
- Clean natural product, absolutely safe in terms of ecology.

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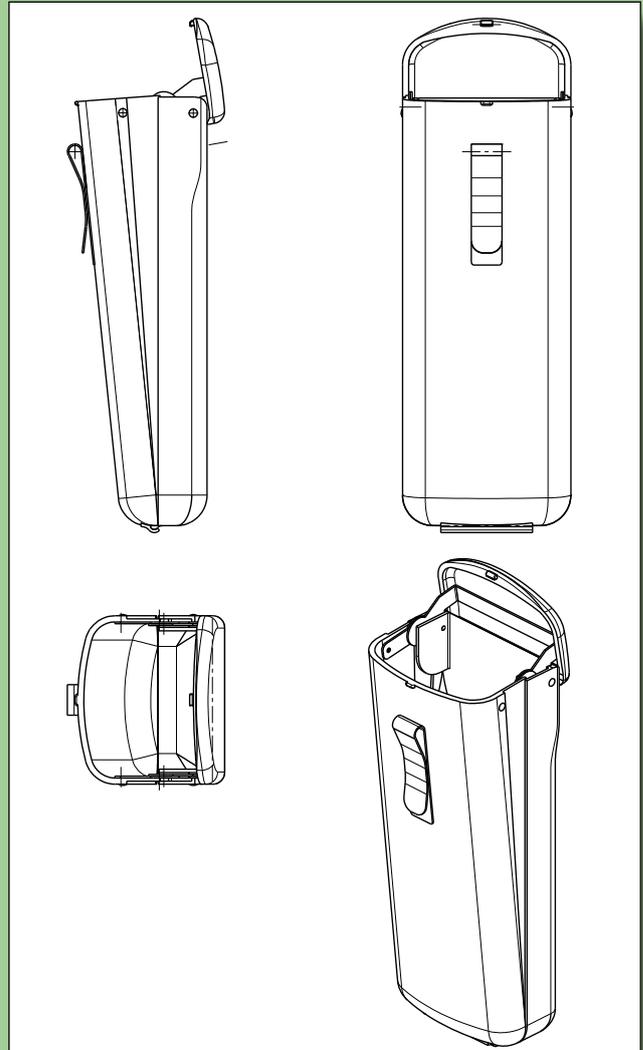
Spectacle case



Description:

The new case is specifically designed to be carried in a front pocket on the body. It features simple functional construction and easy handling. The spectacle case can be opened with one hand. Its lid snaps into place when opened and closed. As the lid does not have a clasp, a lever mechanism will open the case by approximately 10 mm for easier spectacle retrieval.

Integrated into the bottom is a moulded piece of rubber foam which uses a spring to raise the spectacles by approximately 10 mm, once the lid is released. A clip on the front prevents the case from accidentally falling out of the pocket.



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RIEtH Spezialbau GmbH • Mr. Eckehart Rieth Hilleborn 28 • D-37308 Reinholterode

Radio waves for environmentally safe detection and control of wood pest

Insect and fungus control

Once detected with ultra-wide-band sensors, insects can be selectively destroyed by exposure to local microwaves. This is done by utilizing the water content of insects. Like in a microwave oven, electromagnetic waves are emitted at a frequency of approximately 2.5 GHz to induce vibration of water molecules due to their dipole moment.

This causes the water to heat up and denature the protein of wood pests, while affected wood areas are dehumidified at the same time.

The method relies on localized treatment of infested areas. Firstly, it saves an enormous amount



of energy, compared to current methods for thermal treatment of complete building parts. Secondly, it provides a replacement for techniques involving ecologically harmful insecticides and pesticides that are typically also applied to large areas.

Specific and costly preparation of buildings such as sealing or the installation of heat generators is not required.

By locating insects with the help of an ultra-wide-band sensor, we are able to perform targeted control actions and track them for efficiency. Ultra-wide-band sensors can improve and revolutionize our performance in pest management efforts which have relied on microwave radiation for the past ten years.

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Die Teilnahme an der 37. internationalen Erfindermesse Genf 2009 wurde gefördert durch:

STIFT

Stiftung für Technologie,
Innovation und Forschung
Thüringen

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Radio waves for environmentally safe detection and control of wood pest

Detection of insects

With the global exchange of goods growing at extreme rates, we are bound to face the dissemination of wood-destroying insects. Since local biotopes are unprepared for newly emerging species, this may give rise to newly imported forms of life spreading very quickly.

Because the rates of dissemination are dramatically high, no natural predators are able to form. In the case of termites, this has already developed into an economic factor of considerable extent in various parts of the world. Up until now, there have been no reliable methods known to verify infestation by pests without the destruction of the structure of the building.

The invention facilitates the detection of insects living inside wood, based on their feeding motion. A very sensitive ultra-wide-band sensor is used to generate a low-power electro-magnetic wave. Waves of this type easily penetrate into wood where they are reflected by any non-homogeneity in the material (e.g. tree rings, cracks, etc.). A reflected wave is registered by an antenna.

Wood pests are creatures which contain more water than the surrounding wood. Since water provides a very good reflector for electric waves, wood pests can thus be registered with an ultra-wide-band sensor and an antenna. Unlike the typical constituents of wood, insects move, offering a simple criterion for detection. This requires

highly sensitive and stable sensors, because the bodies of insects are very small and only make the minutest movements (e.g. motion of head when feeding).

The proposed method allows both the localization of zones infested by pests and the permanent monitoring and tracking of prior pest control measures. This, in turn, supports the application of environmentally sound and energy saving control techniques.

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UST Umweltsensortechnik GmbH
Mr. Dr. Olaf Kieseewetter Dieselstr. 2
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Certifiable Selective Hydrogen Sensor System Based on the Semicon® Principle

This hydrogen sensor system allows highly selective hydrogen concentration measurement throughout a range from 0 ppm to 40,000 ppm. Its broad working latitude is achieved by innovatively combining a SnO₂-based semiconductor gas sensor with a thermal conductivity sensor (combining the benefits of both measuring principles, whereas their weak points are mutually compensated) into an active multiple-redundant gas sensor system of high sensitivity, selectivity, stability and safety (Semicon® principle). Relevant safety functions like the detection and reporting of fault situations, including during the measurement process, are integral parts. The sensor system is available with and without an indicator and can be modified and certified for specific applications.

Selected technical data:

- Measuring range: 0-40,000 ppm Hz
- Measuring deviation: +/- 10% (of end value)
- Response time at 5,000 ppm (T60): < 1 s
- Operating temperature range of sensor head: -20 °C to +80 °C
- Moisture resistance:
0% of rel. moisture to condensing
- Interface: either analog (0.5 - 5V, linear) or digital (RS232, CAN bus, etc.)
- Operating voltage: 9 V DC
- Gas connection: G1/4 or diffusion
- Sensor head dimensions (without indicator unit and T-piece): Ø 30 mm x 45 mm

Applications:

- Monitoring pipes, stacks and membranes (waste gas side) of fuel cell systems for leakage/concentration.
- Monitoring/control of chemical process equipment and plants/installations in industrial and facility environments.
- Mobile and stationary gas leak detection.

Patent:

EP000001621882A2/A3

[GE] Verfahren und Anordnung zur Erfassung brennbarer Gase, insbesondere zur Erfassung von Wasserstoff

[EN] Method and apparatus for detecting combustible gases, in particular hydrogen

[FR] Procédé et dispositif de détection des gaz combustibles et d'hydrogène en particulier

Trademark:

registration/file number: 30358715.6
Semicon

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Mr. Eckhart Watzke • Leo-Sachse-Str. 14 • D-07749 Jena

Special-Effect Lens for Use in Light Therapy

Light therapy is an established medical procedure. It is preferentially employed for the treatment of patients with autumn or winter depression, but also for the treatment of healthy people. Light therapy can increase mental and physical fitness, restore circadian rhythms (e.g. sleep disorders and jet lag), boost well-being, sexuality and libido, and alleviate pain.

Light therapy sessions are performed with a user sitting in front of an artificial light source emitting a spectrum of light similar to sunlight. Unfortunately, it also includes some constituents that are harmful to the human eye.

As a compulsory prerequisite for light therapy to be effective, the amount of exposure (colloquially referred to as the dose) must be equal to the product of an emitter's light intensity and the exposure time – and not less than 5,000 lux hours.

From this it follows that practical light exposure is performed with these settings:

- Light intensity 10,000 lux Exposure time 0.5 hour
- Light intensity 5,000 lux Exposure time 1.0 hour
- Light intensity 2,500 lux Exposure time 2.0 hours

Understandably enough, every user wishes to spend as short a time as possible in front of the emitter box. However, light intensities of 10,000 lux cannot be applied for every user because the amount of glare may become intolerable even for young healthy users and eye damage may

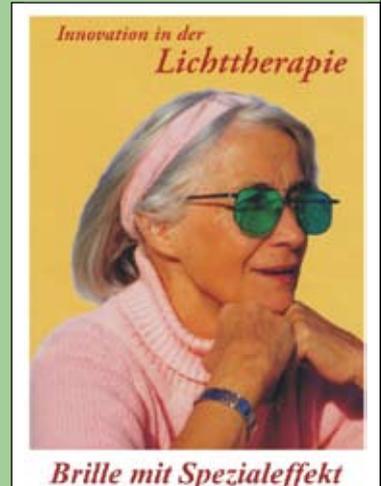
not be excluded. On the other hand, patients with seasonal affective disorder can often only withstand 2,500 or 5,000 lux, so light therapy cannot be employed in these cases.

Using the new plastic lenses as light-therapy spectacles yields a special effect that reduces the amount of glare enough to allow the application of essentially larger light intensities, thus enabling significantly shortened exposure times.

Gaining time is an advantage for users and therapists alike. In addition, it expands the range of potential applications and increases the acceptance of light therapy as a whole.

The transmission features of the new green-colored glass have been selected with a view to guaranteeing "healthy vision" during exposure. This means that ultraviolet protection, reduction of blue light hazard, the capacity of the circadian effect and the human eye's relative luminosity function for daylight vision have been taken into consideration.

Glasses which drastically reduce the level of glare yet facilitate "healthy vision" have not been known up until now.



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