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PEGASUS PRODUCTS PARTNERS WITH GLS THERMOPLASTIC ELASTOMERS TO ROLL THE BONE

Mechanic's Trolley 'Creeper' Surmounts Rolling and Comfort Challenges

KENT, OH - Just because a product has wheels doesn't mean that it will roll effectively. This frustration, plus the pure discomfort of lying on your back attempting to fix pesky mechanical problems drove Pegasus Products Corporation, Inc., to design and market the Bone™ line of creepers.

To explain, the product is a mechanic's trolley that is used to roll under vehicles, into tight spaces, or for any job that requires a person to lie on their back, to name just a few applications. By partnering with GLS Corporation of McHenry, IL, Pegasus Products was able to surmount challenging materials problems. Simultaneously, they engineered the world's most effective and comfortable creeper with wheels that allow the creeper to easily roll over cracks, extension cords, and surface imperfections in its path.

Multiple Challenges

Designing the world's best mechanic's trolley involved two engineering challenges: first, making the surface that the user lays on comfortable and ergonomic. The second challenge was to create wheels that could travel freely over obstacles and cracks that are routinely found in an automotive repair and restoration environment. Although Pegasus Products Corporation, Inc. was not in

business to re-engineer what many car enthusiasts view as the most hateful and agonizing tool in their shop (the traditional creeper), it was necessity that drove what would become the product's best innovations.

Building a Better Mousetrap

Nate Adams, Vice President of Pegasus Products recalls how his father, Dale Adams, came to design what is now sold as the Bone product line. Dale Adams is a gifted automobile restorer, with a particular talent for Jaguars from the 1960's. While restoring a 1966 E type Jaguar, Adams came to hate and dread his creeper—which he was on for long periods of time, fixing exhaust, suspension, linkage and drive train issues on the car. Adams was uncomfortable, his back was pinched, and worst of all, the creeper would not roll over any surface deviations, no matter how minor. A seam in the cement garage floor brought mobility to a halt; going over the extension cord to the drop light was impossible; even trivial things like a loose bolt or small rock would stop the trolley square in its tracks. The only way to surmount these annoying problems was to rock the creeper, or retreat and move the object, or in some cases roll back out from under the vehicle to clear obstacles and choose another path of entry. The net effect from all this fussing with the creeper was a sore back and a loss of productive restoration time spent fiddling with the trolley instead of addressing the urgent mechanical problems on the Jaguar.

Convinced that there was a better way to work under the car, Adams set out to create a creeper that would work as advertised and be comfortable to lie on. First, the shape of the creeper, which traditionally is a flat piece of plywood, was addressed. Since the human body is not flat and the spine, shoulders and hips take on curves, hills, and valleys when the body is laying down, Adams took the basic shape of a healthy back as his template and experimented with a carved balsa wood mold.

With some twists and tweaks of the mold, fiberglass prototypes were made. The workmanship, materials and labor were so cost intensive that it was decided to make the final product in plastic, as the application was perfect for an injection molding process.

However, the wheels presented a problem that was not easily resolved. From a design standpoint, there were 2 challenges with the wheels: finding the right size of the wheels for the desired rolling characteristics, and then locating the right material for manufacturing. After searching the market for existing rolling casters to meet the need, Pegasus Products designers came up empty. Everything that was commercially available was too small, too costly, or not up to operating in a demanding environment with chemicals, dirt, oil, and abrasive surfaces. The company quickly learned that the wheels were heavy and expensive, and the desired solution did not already exist in the marketplace.

Big Wheels Keep on Turnin'

Since a major driver for the Bone product line was the need for the creeper to be able to roll over drop light cords, surface cracks and irregularities, the company determined that the best way to obtain these rolling properties was to use 3" or larger wheels. Making the wheels tough enough for an auto shop, plus light and strong too, proved to be a major undertaking.

Having a big wheel, but placing the user low to the ground on the Bone creeper was the key to obtaining the right balance of rolling freedom and utility from the product. Getting the big wheel on the Bone required that Pegasus Products become experts in caster wheel design. The company decided to design and manufacture their own wheels because nothing suitable was available. In addition, they needed to drive costs out of the wheel components to make the Bone creeper competitive. In order to make the wheels at a competitive price, Pegasus designed a wheel from polypropylene plastics and anticipated molding a rubber as a kind of solid "tire" and then attaching them to a smaller than ordinary metal caster with quality ball bearings for easy 360° swiveling action. By taking material out of the metal caster hub and frame, the company was able to achieve substantial cost savings. But the material for the solid tire was not solved so easily—even though engineers initially believed that this would be the easiest element of the part.

Nate Adams began searching for a material that could bring the shine, grip and durability of rubber to the wheel, without any of the adhesion problems. He consulted molding experts and was steered toward thermoplastic elastomers (TPEs) as the right material for the job. TPEs were a natural choice for Adams because he wanted a "wet look" finish with a quality flat black appearance that was also very durable, soft, grippy, and displayed excellent chemical resistance to oil, solvents, and acids. Sold on TPEs as the right material for the tire, Pegasus Products began testing several different TPE materials. After consulting with a number of suppliers, Adams decided to work with GLS Corporation because of the multitude of technology solutions they had to offer, and the prompt experiential service they received.

Lisa Fiore, Sales Representative for GLS Corporation, recommended that Adams try a specialty TPV alloy called VERSALLOY® XL9055X-9 for the solid tire. The VERSALLOY TPV alloy line was developed to offer high performance properties and excellent flow characteristics, uncommon in soft durometer TPEs. The XL9055-9 had high tensile and tear strength properties, good oil and chemical resistance, and excellent elastic properties. This in addition to the soft 53 Shore A value and the surface aesthetics were exactly what Pegasus Products was looking for in a soft, grippy tire material that offered just the right level of tire "give" to make the rolling comfortable. "The GLS TPEs just had the right 'Crisp' finish aesthetic for our solid tires, and really made the casters look and work great," Adams said. The solvent and abrasion resistance was spot on, and Adams knew that he had the right TPE to make his caster design, and the Bone, roll and operate flawlessly. Plus the cost of the casters was now affordable, and the design was strong and easily mass produced. Able to hold up to 350 lbs with just ¼" of deflection, the Bone creeper and caster wheels are manufactured by Enterprise Plastics, Inc. of Kent, OH using gas assist injection molding technology. They use a 1500 ton press with a 160 oz. Shot barrel, and features wheels that can roll over nearly any commonplace obstacle in its way.

Since the company first marketed what Adams calls "The last creeper you'll ever buy", the public has accepted the product with open arms and his company has, as a result, changed its focus to become a marketer and designer of a wide array of creepers for a variety of applications. No longer in the automobile restoration business (although the family maintains a fleet of impeccably restored Jaguars and still are English car enthusiasts), Pegasus Products Corporation has created a multi-million dollar business from the angst of a pained mechanic seeking a better creeper to make his life more comfortable. The company now offers several products for specific uses, with wheels of up to 5" in the case of the new 2003 product called the Rough Rider. Initially requested by the California Highway Patrol, this creeper has 5 3/8" diameter lugged wheels for use on gravel, dirt, grass or sand to work on tow trucks, recreational vehicles, trucks, farm vehicles, to name but a few uses. Other non-automotive hobbyists and tradespeople have embraced the Bone line of creepers, with freestyle synchronized sky divers using free-rolling creepers to practice their formations on dry land, and carpenters utilizing the trolleys to work comfortably in crawlspaces and attics. As a result, the Bone and other company products are available in automotive tool catalogs, carpentry catalogs, and woodworking shops throughout the United States. Adams reports that he is very happy with the relationship he has maintained with GLS Corporation, and states that the follow-up, expert advice, and quick answers from GLS have helped his company develop what many consider to be the premier creeper on the market today.

GLS Corporation has supplied elastomeric raw materials to the industry since 1979. The company has produced application-specific, custom TPE compounds since 1984. In the year 2001, the firm formed a strategic alliance with TPR manufacturer DSM. Later, in 2002, GLS entered into another alliance with GE Plastics to market a new line of Soft*fx*™ hard engineering resin/soft TPE overmold combinations. And, in the Fall of 2002, they developed a series of specialty rubberized TPU alloys to be sold under the VERSOLLAN™ trade name. Other GLS products offered for molding and extrusion include KRATON® thermoplastic rubber compounds; DYNAFLEX® thermoplastic elastomer compounds; VERSAFLEX® TPE alloys, and new generation VERSALLOY® elastomer alloys, which exhibit enhanced performance properties. Applications

for these materials are found in medical, sports and leisure, automotive, lawn and garden, appliance, kitchen tool, power tool, personal care and industrial markets, among others.

For more information about TPEs from GLS Corporation, contact: Marketing Department, GLS Corporation, 833 Ridgeview Drive, McHenry, IL 60050-7050. Telephone: (815) 385-8500 or (800) 457-8777. Fax: (815) 385-8533. E-mail: info@glscorp.com Web Site: www.glscorp.com

For more information on the Bone line of creepers, or Pegasus Products line of specialty caster wheels, contact: Roger Adams, Vice President Sales & Marketing, Pegasus Products Company, Inc. 315 Gougler Avenue, Kent, OH 44240. Tel: 800-266-3321. Fax: 330-677-4130.
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