Shockproof thermoplastic material based on polycondensation polymers and its production method

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Invention

The present invention relates to a **thermoplastic material based on polycondensation polymers and an effective method for producing it**. The proposed thermoplastic material is based on polycondensation polymers such as polyamides and polyesters, having properties suitable for **manufacturing articles that are resistant to impulsive mechanical stress, particularly impact**.

To obtain these materials, recycled plastics are used, such as processing waste and selected packaging waste, mainly consisting of polyolefins and polyethylene terephthalate.

There are many transformable thermoplastic materials, which are selected based on the applications of the end product. Depending on whether the end product has a structural or simply aesthetic function, whether it needs to have insulating or conductive, anti-wear, anti-static, self-lubricating, colorability, shielding, or shock-absorbing characteristics, it is generally necessary to identify the most suitable polymer to use, possibly subjecting it to appropriate chemical modifications.

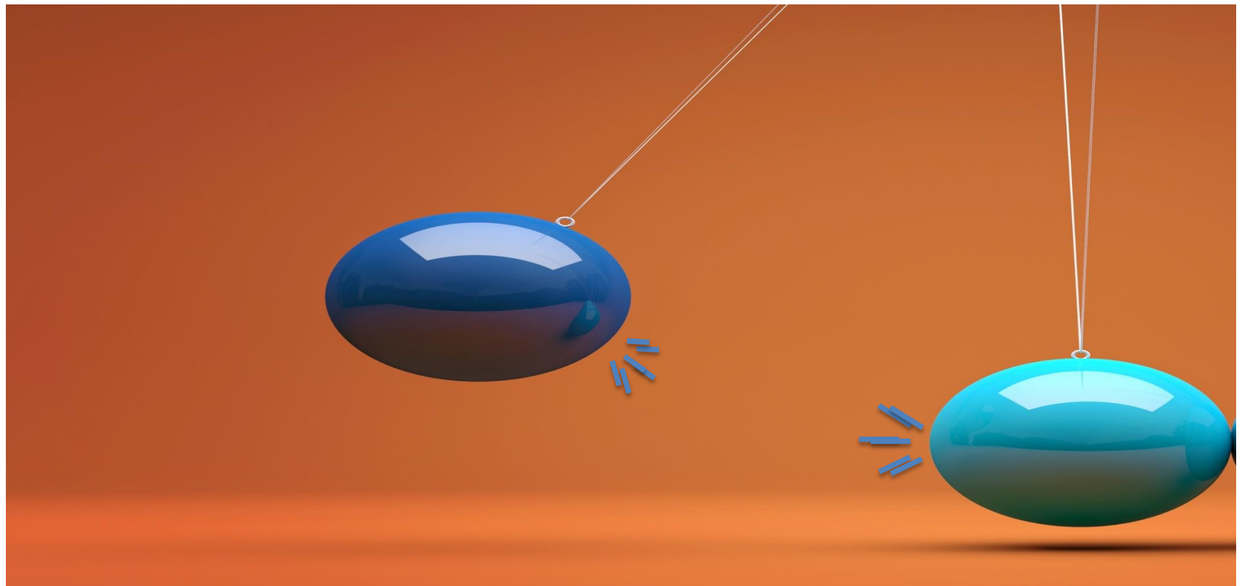
The **plastic materials with anti-shock properties**, object of the invention, are able to offer alternative solutions with high environmental impact, paving the way for the development of innovative artifacts of wide use.

AUSER POLIMERI S.R.L and SPIN-PET S.R.L. are also patent applicants.

Drawings
& pictures

DISCARDS OF PLASTIC

SHOCK-RESISTANT MATERIALS



Industrial applications

In particular, the use of plastics made from scrap polymer materials represents a convenient and eco-sustainable solution for manufacturing of various products, such as hydraulic and mechanical components such as supports, gears, sliding elements, shockproof surfaces, or accessories of various utilities such as packaging, packaging, furniture components, transportation and many other applications.

The proposed invention can therefore be of interest to many **different manufacture sectors (mechanical, hydraulic, construction, ...)**.

The development of the proposed materials is widely used for the realization of:

- **products with impact resistance properties and elastic modulus** comparable to those of ABS resins (polymer used to create light and rigid objects such as pipes, musical instruments, parts or entire car bodies, and toys such as the famous LEGO bricks and plastic modeling kits, and much more);
- **thermoplastic material based on recycled PET of various origins**;
- thermoplastic material that also has **flame retardant and self-extinguishing properties**;
- **PET-based shockproof compounds** from post-consumer bottles, for injection molding (e.g., shopping cart prototype);
- **impact-resistant compounds based on post-industrial PET**, for extrusion into flat sheets (processed after thermoformed prototypes, e.g., for interior parts of caravans and other vehicles).

The main advantage that the invention provides is certainly the reduction of production costs, since it is a thermoplastic material based on a recovered polymeric material, i.e. a polymeric material from processing scraps rather than from selected waste.

Possible developments

The development and use of innovative plastic materials, focusing in particular on circular economy, is expected to be one of the global challenges that is affecting all industrial sectors.

Our purposes allowed the study and the development of a method for manufacturing an **anti-shock material based on polycondensation polymers** such as polyesters, in particular polyethylene terephthalate (PET), polyamides or polycarbonates, suitably functionalized. The base polymer was admixed with a polyolefin-based reactive modifier capable of mixing with the polymer base, modifying its properties and getting the impact resistance property.

The implementation of the proposed invention can be undertaken in collaboration or on behalf of interested companies in order to find the most suitable technology for each requirement. The production of new advanced materials from products discards or selected waste remains the basic principle of the proposed technology.

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