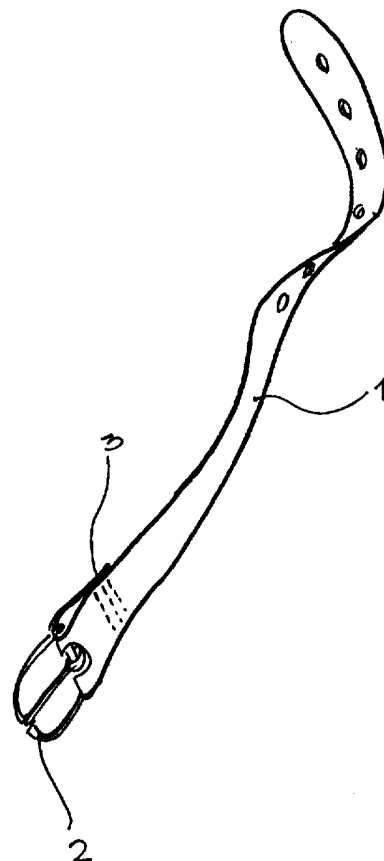




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(54) Title: ELASTIC BELT (57) Abstract Elastic belt (1), for men, women or children, which conforms to the anatomy and is characterised by a strip of extruded or injected heat-sealed thermoplastic polyurethane with two different types of finishing at the ends: a) at the position (3), the buckle is retained by a folded section of the polyurethane and is fastened by high-frequency sealing; b) the opposite end of the belt is finished with a leather appliqué that is sewn with the traditional method.		



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Description
ELASTIC BELT

Technical field

5 This invention regards an elastic belt for men, women and children which conforms to the anatomy and is built as an extruded piece of heat-sealed thermoplastic polyurethane

At present, belts are built in natural materials such as hide, leather or split. They are manufactured with antique cutting and sewing methods that have been used for a vry long time.

10 The raw material is cut into a height of 3-5 centimeters and a length ranging from 70 centimeters (for children's belts) to 130 centimeters (for adults' belts).

Belts in special size can be built upon request.

Lining for creating expanded convex areas are prepared separately for use
15 in some models. These linings are made of leather products or synthetic fabrics and are used to cover the inside of the belt with a lining that is hidden from sight.

Besides having suche convex areas, some models are also padded.

The parts prepared in this way are glued with specifically designed
20 adhesives, and special equipmente is used to trim and dye the edges. Holes are then drilled and buckles and loops are fitted as the final step.

Disclosure of the invention.

This type of belts suffers from many limitations in terms of both serviceability and appearance.

25 The main limitation is represented by the raw material: since is totally lacks flexibility and elasticity it adapts poorly to the human form.

At present, belts are still built to permanently resist breakage and thus exert a strong non-deformable grip that will not yield in either height or width, exactly the opposite of what the body requires, since it is subjected to
30 thousands of factors (both internal and external) which cause its volume to

- 2 -

vary continuously.

The raw material also represents a prominent restriction with regards to the appearance of the traditional belt. Since the material can be finished in only a limited number of ways and coloured in only a limited number of colours,

5 it is poorly suited to meeting the requirements of modern trends in the world of fashion and sports.

Overcoming the limitations mentioned above, the subject of this invention is a belt made of an extruded piece of heat-sealed thermoplastic polyurethane, which can be used by men, women and children with equal success.

10 The special material used in this belt is characterised by its ease of being custom-processed and die-cut (with a very low percentage of waste as well) and by its remarkable elastic properties, high mechanical strength, resistance to temperature changes and atmospheric agents, softness to the touch and imperviousness to solvents, oils and greases.

15 It can easily be bonded to other materials by flame or cold rolling and may be subjected to thermal moulding, post-injection of polyurethane foams and high-frequency heat sealing process. Furthermore, it can also be sewn and glued with conventional techniques.

It is available in a wide range of colours and surface finishes, as well as with
20 varying degrees of hardness, elasticity, strength etc.

What's more, it can be produced in thicknesses of 150 microns or more.

A belt in thermoplastic polyurethane offers numerous advantages and properties, the most important of which are :

a- Elastic modulus (elasticity)

25 Thanks to its ability to twist easily and to yield in height and width, this material will not compress the abdominal area of the body to an excessive degree. As a result, the viscera are not overly constricted when the volume of the body increases.

The abdominal area tends to increase of volume to a greater or lesser extent
30 after meals or when the body is in a compressed position (such as when

- 3 -

seated) - even if the individual is healthy.

This may cause an annoying feeling, or even pain or serious damage who suffer from obesity or abdominal pathology such as colitis and gastritis.

b- Surface finishing

- 5 Polyurethane can easily be coloured into many diverse shades and can be silk-screened or printed as desired so that any wording or symbol can be reproduced.

This makes it particularly suited to the world of fashion and sports.

c- Low manufacturing cost

- 10 Waste is very low when thermoplastic polyurethane is used (unlike leather products), since the material is processed in the form of an extruded sheet or ribbon or strip or other shape with the desired dimensions and cross-sectional area.

For the purpose of this invention, the material can be produced :

- 15 1 as a sheet with height of up to 2 meters, which is rolled into industrially-sized rolls for die-cutting into the desired size;
2 in a ready-to-use extruded strip with the desired cross-sectional area and thickness.

- Additional characteristics and advantages of this invention are outlined in greater detail in the following description, which is exclusively provided as a non-limiting example depicted by the two blueprints, in which:

- 20 - Fig. 1 shows a belt (1) built according the principles of the invention, which is characterized by a strip of extruded or injected heat-sealed thermoplastic polyurethane with two different types of finishing at the ends :

- 25 a) At the position 3, the buckle (2) is retained by a folded section of the polyurethane and is fastened by high-frequency sealing;
b) The opposite end of the belt is finished with a leather appliqué that is sewn with the traditional method;

- Fig. 2 shows a side view of the human body in the seated position, with the abdominal region restrained by a leather belt that cannot be deformed or
- 30

- 4 -

stretched;

Fig. 3 shows the same human body in the seated position, but with the abdominal region restrained by a pliable belt in thermoplastic polyurethane.

The table below lists the typical properties of thermoplastic polyurethane, which has proved to be particularly suited for creating the belt described by this invention.

Type:	thermoplastic resin polyether-urethane polyester-urethane
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10 Properties:

Specific weight	1.12 / 1.19 g/cm ³ (DIN 53479)
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Hardness (Shore "A")	65 / 93 (DIN 53505)
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Load:	breaking load 30 / 47 N/mm ² at 50% 4.9 - 8.9 N/mm ² (DIN 53505)
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15 Ultimate elongation: 550-800% (DIN 53504)

Melting point:	185 - 200 °C
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Materials with the characteristics described above (and which are thus suited for the purposes of this invention) are produced by :

PENNEL & FLIPO	384 rue d'Alger 59052 ROUBAIX - cedex France
SOLTER sas	via Trento, 7 SOLBIATE OLONA (Varese)- Italy
ELF-ATOCHEM	PARIS-France, distributed by ELF-ATOCHEM, via Murat 20159 MILANO, Italy
API	Via Dante Alighieri, 27 CASONI MUSSOLENTE (VICENZA) Italy
ALFAPLASTIC	ROSA' (Bassano del Grappa) VICENZA - Italy

CLAIMS

1. An elastic belt consisting of an extrusion of thermoplastic polyurethane on which a buckle has been installed and in which one or more holes have been made, characterised by the fact that the belt is made of an extrusion of
5 thermoplastic polyurethane produced as a strip in the corresponding width and thickness, or obtained by die-cutting a larger extruded sheet, or obtained from a hollow tube.
2. The elastic belt described in claim 1, characterised by the fact that the extruded material is a thermoplastic "polyether-urethane" resin.
- 10 3. The elastic belt described in claim 1, characterised by the fact that the extruded material is a thermoplastic "polyester-urethane" resin.
4. The elastic belt described in the preceding claims, characterised by the fact that the specific weight of the thermoplastic polyurethane is
1.01 - 1.30 g/cm³ (DIN 53479).
- 15 5. The elastic belt described in the preceding claims, characterised by the fact that the SHORE "A" hardness of the thermoplastic polyurethane is
65-90 (DIN 53505).
6. The elastic belt described in the preceding claims, characterised by the fact that the ultimate elongation of the thermoplastic polyurethane is
20 200 - 900 % (DIN 53504).
7. The elastic belt described in the preceding claims, characterised by the fact that the melting point of the polyurethane is 120 - 280 °C .
8. The manufacturing procedure for the elastic belt described in the preceding claims is characterised by the fact that sheets or rolls of
25 thermoplastic polyurethane are die-cut to the required size.
9. The elastic belt described in the preceding claims, which is characterised by the fact that at least the following steps are involved in its production:
a) Cutting of the extruded piece, reel, tube or sheet of thermoplastic polyurethane to a predetermined size, which such cutting also involving the
30 creation of holes at one end for installation of a buckle and at the other end for selecting the diameter of the belt when worn;

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b) Attachment of the buckle with a folded edge of the belt itself, such edge being fastened by heat-sealing or high-frequency sealing; or, as an alternative, attachment of the buckle with hardware passing through the belt and subsequent finishing of the ends with appliques of traditional materials such as leather or hide, since the use of such appliques in no affects the quality and elastic properties of the belt created according to this invention.

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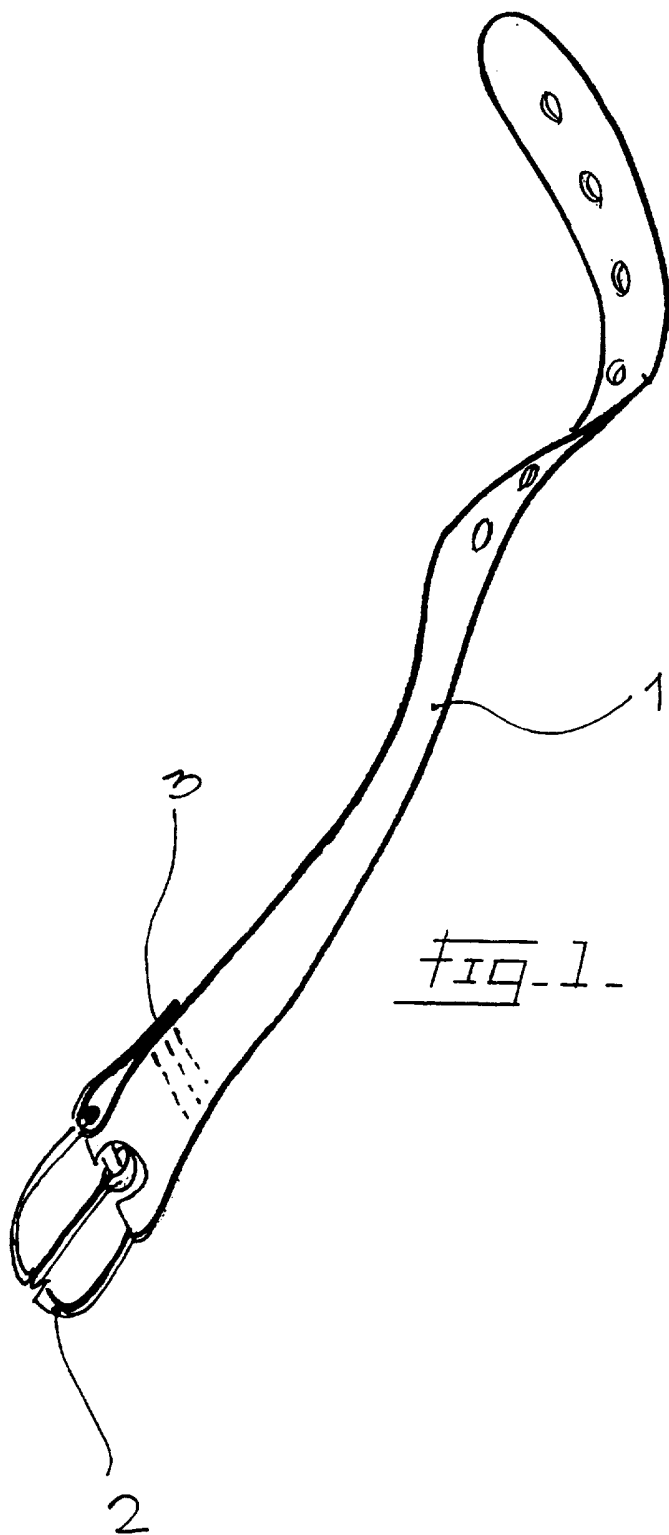
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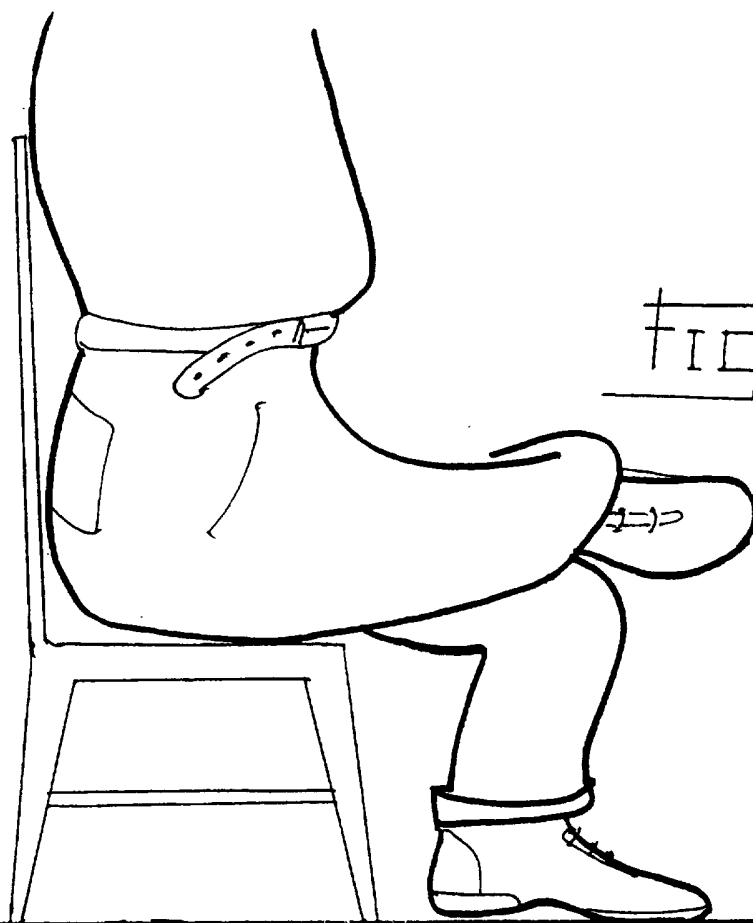


fig. 2.

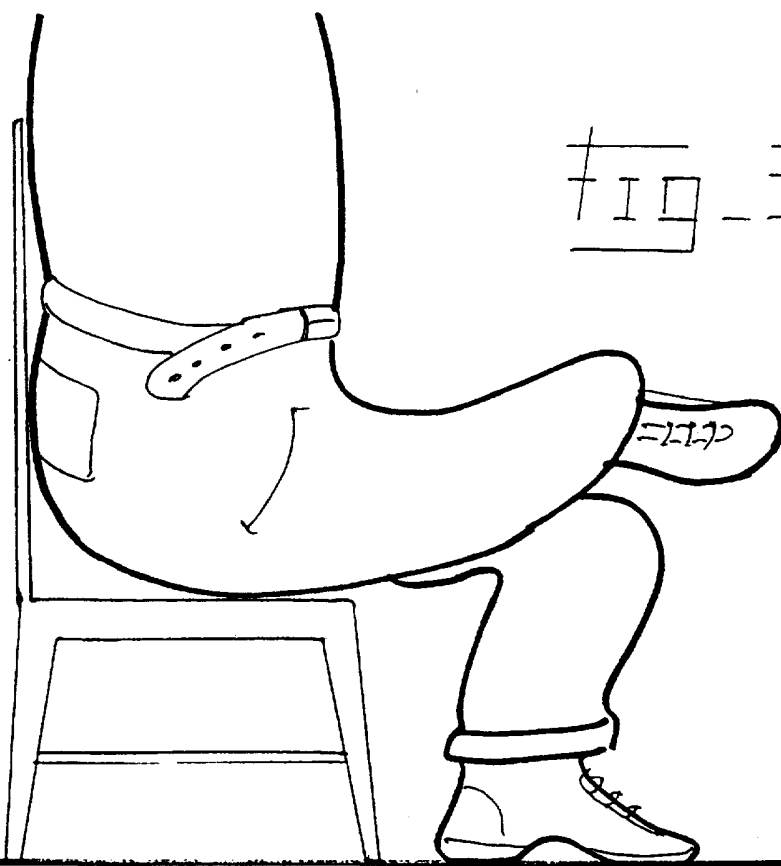


fig. 3.