

**Excercise 1 - Creating claims for an innovative protective underwear for wheelchair users**

1. Background of the Invention

Decubitus or bedsores may occur if, over a longer period of time, a contact pressure acts on a skin area that is not sufficiently relieved by relocating the body. Thus, decubitus mainly affects people who are forced by a disability, illness or age in a consistent sitting or lying position. In particular, the areas of the body most affected by decubitus are those that are not protected from contact pressure by muscles or fatty tissue, which includes, in particular, the trochanters of the femurs or the sacral region. Decubitus poses a grave physical and psychological burden for the affected persons, thus, a complex therapy is required. For this reason, measures are of great importance that prevent the occurrence of bedsores. Such measures include, in particular, the frequent relocation of the body, which, however, may result in considerable physical stress for the patient or require the use of trained nursing staff.

It has already been proposed in the prior art to prevent the occurrence of decubitus by means of protective clothing.

For example, in FR 2,745,986 (figure below) a garment is shown which is intended to protect a wearer from decubitus. For this purpose, the garment has a textile layer and an elastic gel material arranged on the inner surface, which is in contact with the skin of the wearer.

Such garments are generally well suited to avoid or at least significantly reduce the formation of decubitus on body parts with increased contact pressure. In practice, however, it has been found that the positioning of the gel sections at the intended positions is difficult. Due to the elastic formation of the garment it may easily come to misplacement or slippage of the gel sections during dressing and thus, the protective effect is impaired. This problem occurs especially in the case of wheelchair users who put on the garment without assistance in a sitting position. In this case, large pulling forces have to be

applied to the tight-fitting garment, causing a significant expansion of the garment in the region of the protective gel sections, which makes the correct positioning of the gel sections difficult.

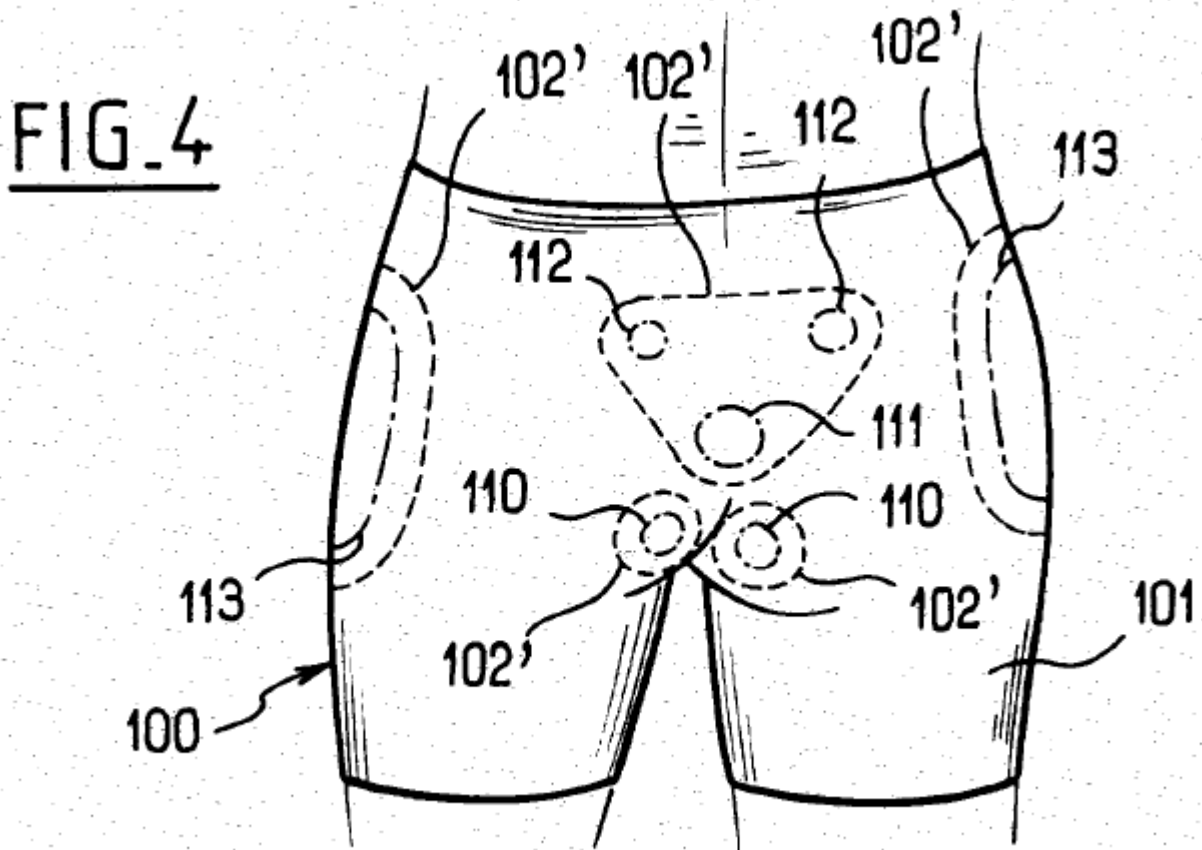


Figure 1: In the prior art of FR 2,745,986 five gel pads 102 are provided, which are arranged on the bearing surfaces of each of the seat leg 110, the greater trochanter 113, the sacrum 111 and the hip bone 112.

Accordingly, the object of the present invention is to provide a protective undergarment, which allows for an exact positioning of the protective elements at the sensitive body parts.

## 2. The Invention

To solve this problem, a protective undergarment has been developed, which is shown in the drawings below.

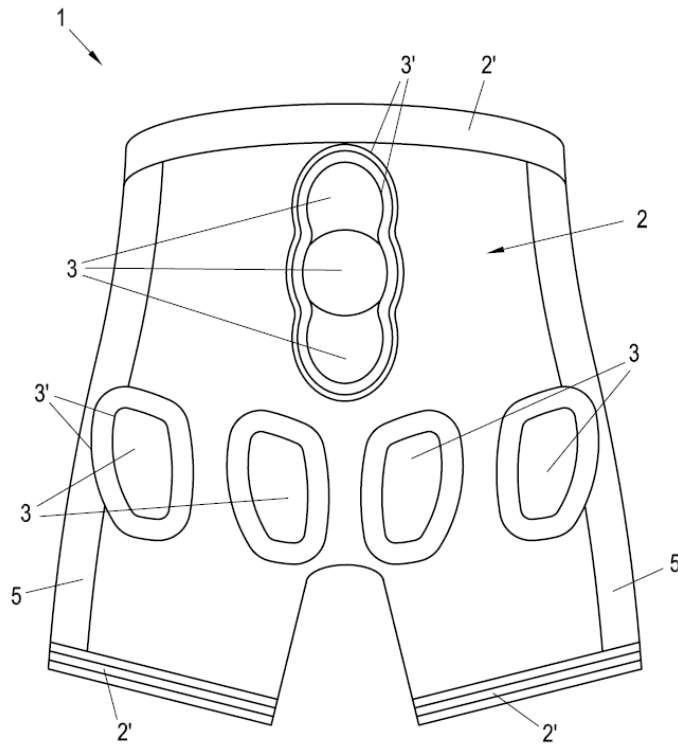


Fig. 1

In Fig. 1, a first embodiment of a protective undergarment 1 is shown that protects a wearer from the occurrence of decubitus. The protective undergarment 1, which is suitable in particular for wheelchair users, comprises a laundry item 2 made of a textile material, which is designed to be elastic for a precisely fitting covering of a body region of the wearer. In use, the laundry item 2 therefore fits the corresponding body area. In the shown embodiment, the laundry item 2 forms a pair of underpants, which extends from the thigh area to the hip, abdomen and lower back area. Decubitus or bedsores occur on body parts exposed for an extended period of time to increased contact pressure or high shear forces. In the protective underwear 1, these body parts are protected by pad-shaped protective elements 3, hereinafter referred to as pads 3, which significantly reduce the tear on the skin and the underlying tissue.

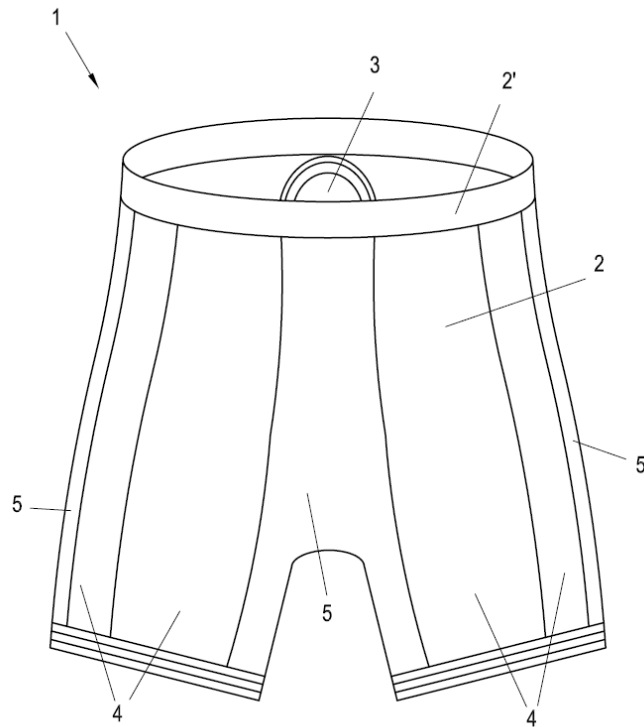


Fig. 2

As can be seen in particular from Fig. 1, two separate pads 3 are arranged centrally on the back of the underpants. The pads 3 come in contact with the projections formed by the sacral bone or the tailbone. In addition, corresponding pads 3 are provided laterally on the underpants which are positioned in the area of the greater trochanter of the femurs. In addition, three longitudinally adjacent pads 3 are provided, which ensure protection of the bearing surfaces in the lumbar vertebrae. The pads 3 reduce the pressure exerted by the bone protrusions, whereby the development of decubitus is significantly delayed or completely prevented.

For decubitus prophylaxis, it is essential that the pads 3 are positioned exactly at the body areas subject to increased contact pressure. The underpants are designed to achieve a tight and elastic fitting to the appropriate body area. For putting on the protective underwear 1 in a seated posture high pulling forces are required in the prior art, which basically can cause a significant deformation of the elastic protective underwear.

This would mean that the pads 3 are not placed at the desired locations.

In order to ensure an exact positioning of the pads 3, without affecting the flexible adaptation of the underwear to the body dimensions of the wearer, the laundry item 2 of the invention comprises longitudinal strips 4 extending over its entire length. Strips 4 are made of an elastic material with a lower elasticity in the longitudinal direction than in the transverse direction (see Fig. 2). In the shown embodiment, the longitudinal strips 4 are provided laterally on the underpants, where they are easily accessible to the wearer. To put on the underpants, the wearer who has slipped into the trouser legs grips the lateral longitudinal strips 4 and pulls the pants upwards. Longitudinal strips 4 hardly expand despite the pulling forces in the longitudinal direction. Thus, the pads 3 can be arranged precisely at the sensitive areas to be protected. In contrast to known protective underpants, a subsequent adjustment of the pads 3 is not necessary. In the shown embodiment in FIGS. 1, 2, two longitudinal strips 4, which are substantially non-deformable in the longitudinal direction, are provided laterally, have a different width.

As can be seen in FIGS. 1, 2, in each case strip-shaped sections 5, which have a direction-independent elasticity, are provided centrally on the lateral regions of the underpants. These sections 5 improve the accuracy of fit of the pants 2. Another directionally independent elastic portion 5 is provided at the front of the pants 2 to ensure a comfort-enhancing flexibility in the genital area of a male wearer.

### 3. Task:

a) Draft an independent claim that ensures the best possible protection for the invention!

b) Draft dependent claims which protected preferred embodiments of the invention!

Hints:

- Start from the closest prior art of FR 2,745,986. Do not consider any other prior art from your personal experience.

- Formulate the independent claim in two-part form, wherein the known features A, B, ... from FR 2,745,986 are in the preamble and the distinguishing feature X is in the characterizing portion (introduced by "characterized in that"):

"1. Item with features A, B, ..., characterized in that feature X. "

- The distinguishing feature X for the independent claim is supposed to solve the problem posed by the invention.

- dependent claims have the form

"2. Item according to claim 1, characterized in that feature Y.  
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