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ELBOW PROTECTOR FOR BEDFAST PERSONS

Filed May 1, 1968

Fig. 1

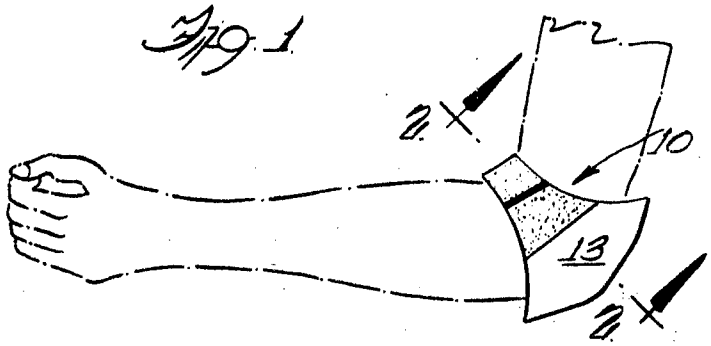



Fig. 2

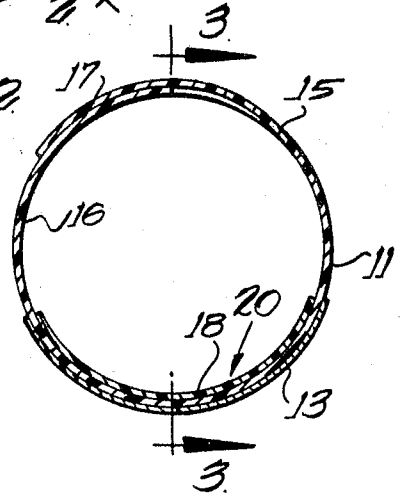



Fig. 3

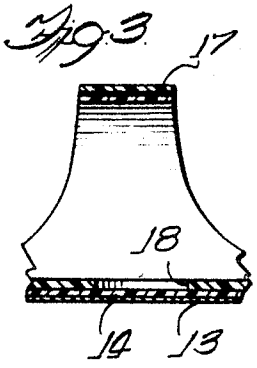
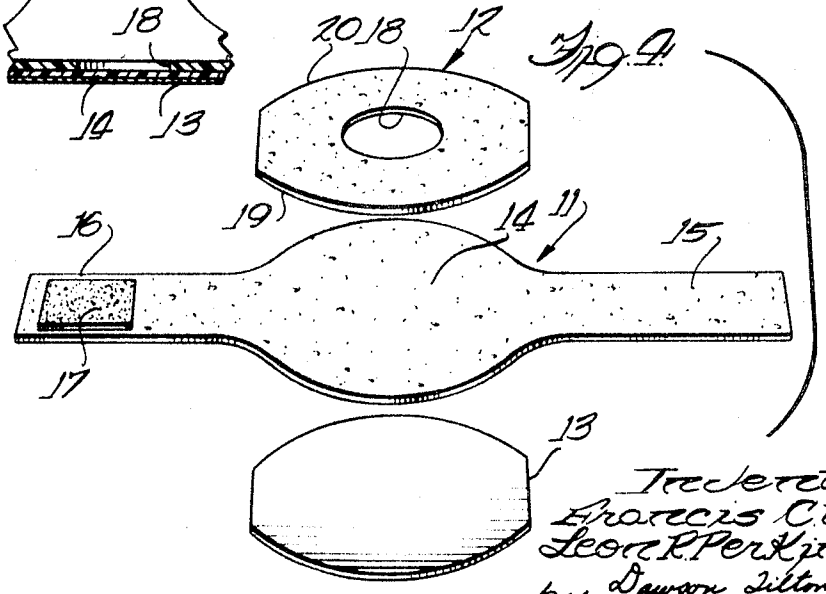



Fig. 4




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# ELBOW PROTECTOR FOR BEDFAST PERSONS

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## ABSTRACT OF THE DISCLOSURE

An elbow band for protecting bedridden persons against decubitus ulcers includes an elongated belt of resilient, stretchable, air-permeable sheet material having an enlarged central portion with oppositely-extending side straps. A cushioning pad of the same material as, and preferably thicker than, the belt conforms to the shape of the central portion of the belt. The cushioning pad is attached to one surface of the central portion. A paper film is bonded to the other surface, covering the enlarged portion of the belt and providing a smooth bearing surface for engaging bedclothes. The cushioning pad defines an aperture for receiving an elbow; and the combined pad and belt provide a recess which encompasses the tip of the elbow and holds the band in place. The outer end of one strap is provided with an adhesive agent for securing the two straps together in front of the elbow crevice.

## Background

The present invention relates to an article for protecting a bedfast person against decubitus ulcers; more particularly, the article is specifically designed to attach to an arm to prevent decubitus ulcers in the region of the elbow.

Previous devices for protecting against and treating decubitus ulcers, or bedsores as they are commonly known, are designed to provide spot protection of pressure sites. Typically, such devices include a pad of fleecy material such as sheepskin or a synthetic fiber secured to a rubber-reinforced bandage. These pads are supplied in a number of different sizes depending on the intended location of application.

Another known device for protecting against the formation of bedsores is cushions or pads which are intended not to be secured to the affected portion of the bedridden person, but rather, to be placed on the area which he contacts, such as a bed, chair, or armboard. These pads, again, are supplied in a number of different sizes; and although they may be cut to make pads for elbow or heel protection, as desired, some means, such as tape, must be provided to secure the pad to the affected area. Again, these larger pads employ a fleecy pile which contacts the patient.

In either form, prior devices are expensive enough so that they are not considered to be disposable after use. Rather, they are autoclaved or otherwise sterilized and reused. Further, in the case of the larger pad, the backing is usually provided with a non-slip coating so that the pad does not move around once it is placed. This coating or film may inhibit the passage of air to the affected skin surface.



## Summary

The elbow protector of the present invention includes a belt, preferably of flexible, open-cell plastic or rubber foam which has an enlraged central portion having a transverse dimension sufficient to cover the elbow and oppositely-projecting straps integral with the central portion. A paper backing or film is secured to one side of the belt to cover the central portion; and it provides a smooth, non-abrasive, surface for easy movement along bedclothes. A cushioning pad is secured to the other side of the belt; and it defines a central aperture for receiving an elbow.

The cushioning pad is also formed of a flexible, soft, resilient, open-cell foam plastic or rubber sheet material; and the recess defined by the combination of the cushioning pad aperture and the belt is sufficient to "lock" the protector with the elbow for all positions of the arm except the fully-extended position in which there is little likelihood of dislodging it.

The straps of the belt reach around the front of the elbow and are secured together at the crevice in front of the elbow. They pull the material of the center body in complete wrapping engagement with the exposed surfaces of the elbow for protecting it. One of the straps is provided with pressure sensitive adhesive so that the two straps may be fastened together.

Thus, the present invention provides an economical elbow protector which, although it may be autoclaved or otherwise sterilized, is inexpensive enough to be discarded after use. The smooth surface provided by the paper film backing allows easy, non-gripping movement of a bedridden person; and the protector remains securely fastened to the elbow despite rubbing against bedclothing and the like. The stretchability of the straps on the protector accommodate it to fit different size elbows, and further allow the unimpeded bending of the arm without causing irritation of the tender skin at the crevice of the elbow. Any desired degree of cushioning may be obtained by varying the thickness of the cushioning pad; and any reasonable thickness of this pad will allow it to be secured to the belt by fusion.

Other features and advantages of the present invention will be obvious to persons skilled in the art from the following detailed description of a preferred embodiment accompanied by the attached drawing wherein like reference numerals will refer to the same element in the various views.

## The drawing

FIG. 1 shows an elbow protector according to the present invention secured to the arm of a wearer;

FIG. 2 is a longitudinal cross section view of the elbow protector of FIG. 1 taken through the sight line 2—2 thereof;

FIG. 3 is a transverse cross section view taken through the sight line 3—3 of FIG. 2; and

FIG. 4 is an exploded perspective view of the inventive elbow protector.

Detailed description

Referring first to FIG. 1, an elbow protector according to the present invention is generally designated by reference numeral **10**; and as shown therein, it is secured to the arm of a wearer. It will be appreciated that when thus secured, the protector must accommodate itself to the various motions of the arm from one in which the forearm is fully extended and lying colinear with the upper arm through a position in which the forearm makes an acute angle with the upper arm. There is considerable difference in the circumference of the arm at the elbow during these various motions; and it will be appreciated that the tender skin in the elbow crevice could easily be irritated by abrasive contact with the strap which secures the protector to the arm. As will be explained in greater detail within, the present invention overcomes this problem with the stretchability of the straps securing the pad to the arm together with the soft, non-abrasive texture of the portions of the protector which engage the skin.

Turning now to FIG. 4, the protector **10** includes a belt generally designated **11**, a cushioning pad generally designated **12** attached to one side of the belt **11**, and a paper film backing generally designated **13** attached to the other side of the belt **11**.

The belt **11** has a generally oval-shaped central portion **14** and oppositely-extending straps **15** and **16** integral with the central portion **12** and extending along the longer axis thereof. The central portion **12** has a transverse dimension sufficient to cover the bottom and back of the elbow to be protected; and the length of the straps **15** and **16** is sufficient to extend around the arm so that they may be secured together at the side of the arm opposite the tip of the elbow (i.e., the elbow crevice). Preferably, the belt **11** is made of a thin sheet of open-cell foam plastic or rubber; and it is stretchable and resilient.

Plastic polyester-based, flexible urethane foam has been found to have many advantages, among which are its durability, resistance to tear, and stretchability. The pore density of a preferred polyurethane sheet material is about 50–60 pores per lineal inch, although foams of a density less than 5 lbs. per cubic foot are suitable. A patch **17** of double-coated pressure-sensitive adhesive is secured to the strap **16** for fastening the two straps **15** and **16** together as seen in FIG. 1 in securing the protector to the arm of a wearer. A conventional release strip (not shown) is provided to cover the adhesive prior to use.

The paper film backing **13** may be of a thermoplastic-coated paper (for example polyethylene) which generally conforms to the shape of the center portion **14** of the belt **11** and is secured thereto throughout the contacting surfaces of these respective elements by heat-sealing to bond the polyethylene to the plastic foam. The paper backing **13** thus provides a smooth, bearing surface of reduced friction which facilitates movement of the protected elbow along bed-clothing and the like.

By attaching the backing **13** to the center body, not only is there provided a smooth bearing surface, but the stretching of the belt **11** is confined to the extended straps **15** and **16** thus maintaining the thickness of the cushioning pad for all arm positions. Without the backing, the center portion and the cushioning pad would stretch the most (and hence provide the least cushioning) for those positions wherein padding is needed most (i.e., the bent arm position).

The cushioning pad **12** has a periphery which generally conforms to the marginal edges of the center portion **14** of the belt **11**; and it defines a center aperture **18** which is designed to receive an elbow. The recess defined by the thickness of the cushioning **12** and the belt **11** prevents slipping of the protector along the arm by locking with the tip of the elbow. The cushioning pad **12** may be of the same material as the belt **11**; however, its thickness may be substantially greater depending upon the degree of cushioning desired. The cushioning pad **12** is secured to the belt **11** by fusing the two together about the edges **19** and **20** according to known methods. The open-cell nature of the polyester urethane foam greatly enhances the transmission of air to the protected areas for preventing perspiration and the accumulation of heat at pressure sites. By sealing the cushioning pad **12** to the belt **11** only at the outer marginal edges thereof, there is no laminate between the two; and this further enhances the conduction of air to the covered areas.

Turning now to FIGS. 2 and 3, it is seen that the inventive elbow protector accommodates itself to different-size elbows and different elbow positions while maintaining a snug attachment to the arm. Further, the stretchability of the straps **15** and **16** accommodates free and easy movement of the arm without irritating the skin of the elbow crevice.

It will also be appreciated that by fastening the straps of the belt **10** in front of the elbow crevice, the sides of the center portion **14** will be drawn about the arm in wrapping engagement for further protection while continuing to provide the extended, smooth bearing surface afforded by the paper backing **13**.

For purposes of explanation by way of example, the dimensions of a specific elbow protector according to the present invention will now be given. The overall longitudinal dimension from the end of one strap to the end of the other is approximately 17 in. The length of the cushioning pad is 5½ in.; and its width (i.e., the transverse dimension of the center portion of the belt) is 4½ in. The diameter of the elbow-receiving aperture is 1¾ in. The thickness of the foam comprising the belt is ⅛ in.; whereas the thickness of the foam comprising the cushion pad is $\frac{3}{16}$ in. It will be appreciated by persons skilled in the art that both the shape illustrated and the dimensions given may be varied greatly without departing from the principle of the invention; and further modifications may be made (such as perforating the paper backing **13**) without departing from the inventive principle.

The elbow protector described above has been found to be an inexpensive, non-flammable, non-allergenic device for protecting against the formation of decubitus ulcers; and although it may be washed or sterilized by autoclaving, it is economical enough so that it may be discarded after use.

We claim:

**1.** A band for protecting the elbow of a bedridden wearer against abrasive contact with bedclothes comprising: a belt of stretchable, resilient, air-permeable, soft sheet material having an intermediate portion of transverse dimension sufficient to cover an elbow, and first and second oppositely-extending straps integral with said intermediate portion and extendable about an arm for fastening together and securing said band to the arm; a cushioning pad of soft, air-permeable, resilient sheet material attached to one side of said belt at said intermediate portion, and defining an aperture for receiving an elbow; and a backing film having a smooth exterior surface attached to the other side of said belt at said intermediate portion for providing a smooth surface to engage bedclothes without substantial reaction.

**2.** The article of claim **1** wherein said belt and said cushioning pad are formed of open-cell polyurethane plastic foam having a density of less than about five pounds per cubic foot.

**3.** The article of claim **2** wherein said backing film is a thermoplastic-coated paper bonded to said belt.

**4.** The article of claim **1** further comprising: adhesive means secured to one of said straps; and a release strip covering said adhesive whereby said straps may be adhesively secured together.

**5.** The article of claim **1** wherein said intermediate portion lies at the center of said belt and said straps are of approximately equal length.

6. The structure of claim 1 wherein the transverse dimension of said intermediate portion is at least three inches.

7. The article of claim 6 wherein said cushioning pad conforms to the shape of said intermediate portion at its marginal edges and is fused thereto only at said edges.

8. The article of claim 7 wherein the thickness of said belt and said cushioning pad are each between 1/32 and 1/4 of an inch.

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JAMES R. BOLER, Primary Examiner

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