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(54) Abstract Title
Protective cap

(57) A disposable protective cap comprising a crown piece 3, a shock absorbent member (Fig 2, 7) extending around the fore, sides and rear of the head, and means 6 for attaching the shock absorbent member to the crown piece. The shock absorbent member may be releasably attachable to the crown-piece. The crown piece may comprise a plurality of strips 4 and a crown-piece band 2, each strip extending from one side of the crown-piece band to the other, forming a cruciform when viewed in plan. The crown piece may be formed from layers of lightweight plastics materials, incorporating elastic threads for secure, and adjustable, fitment.

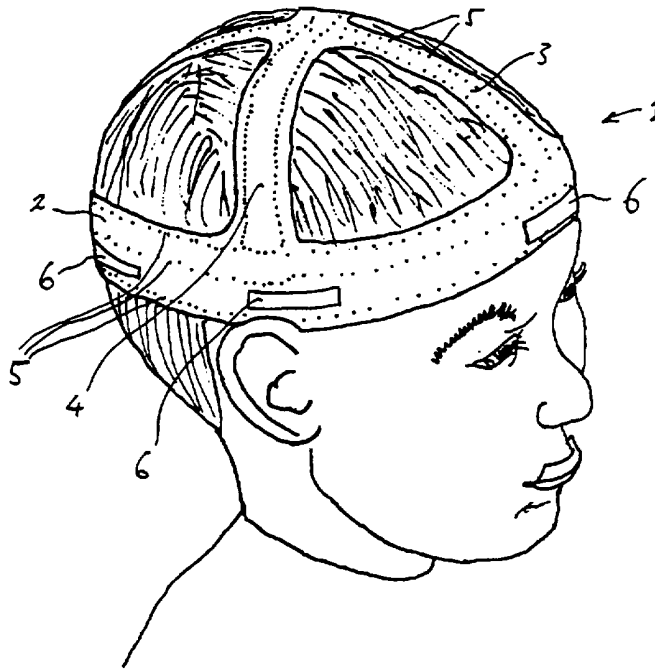


Fig 1

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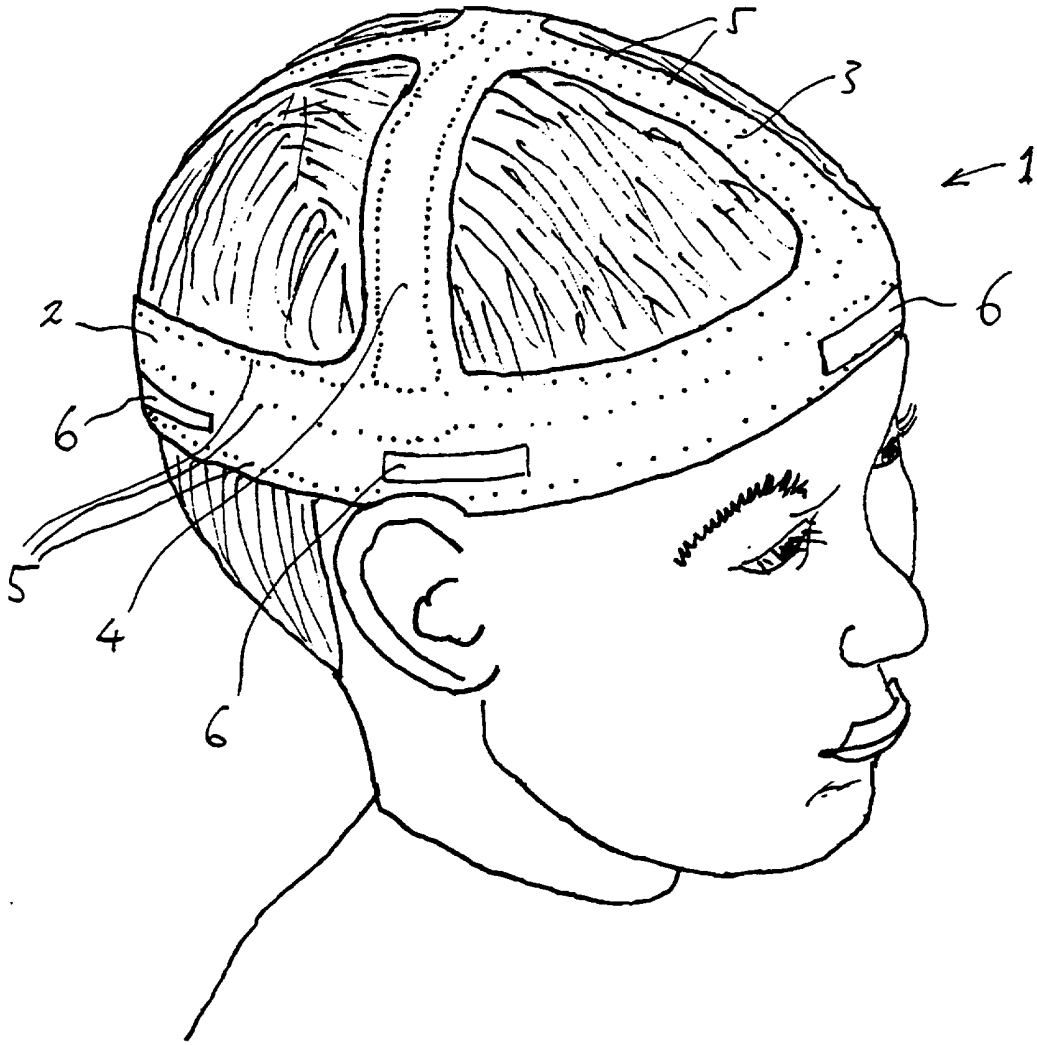


Fig 1

Fig 2

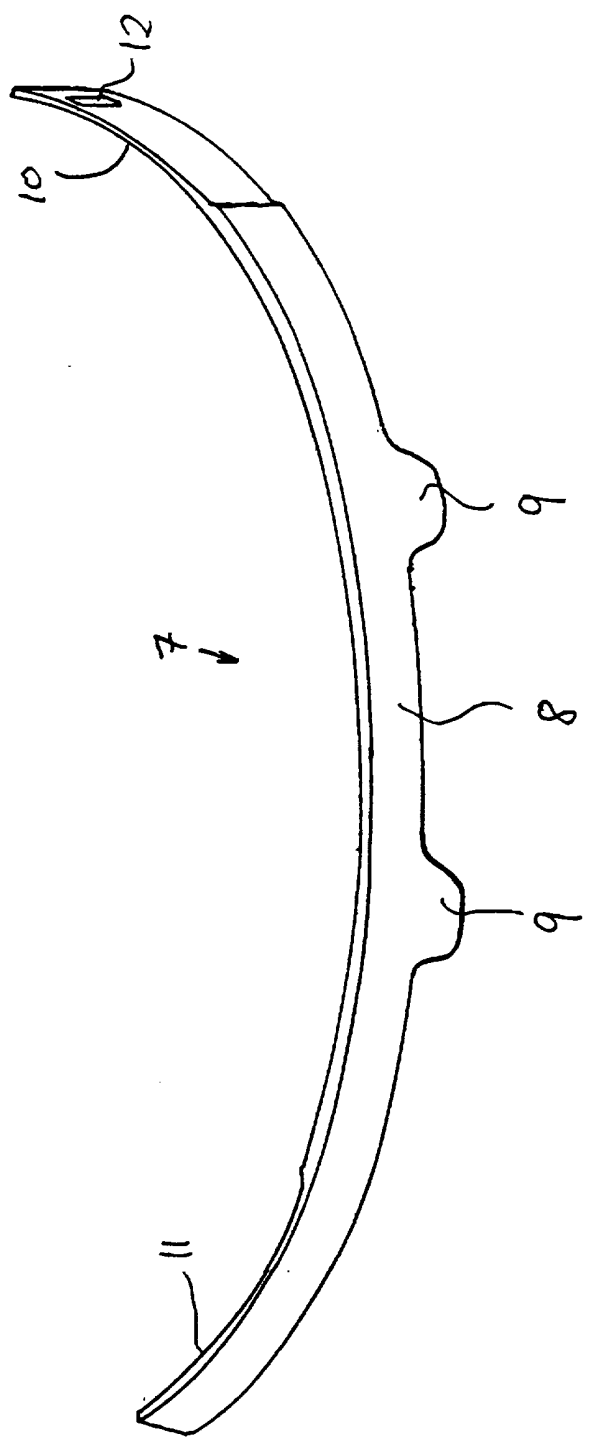
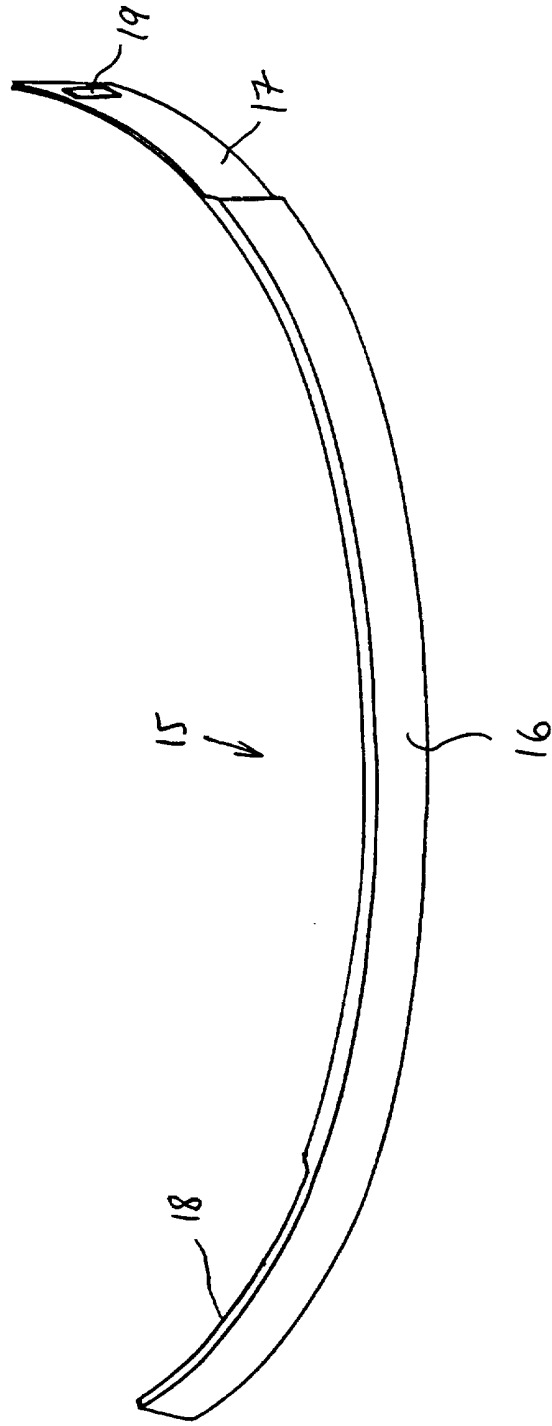


Fig 3



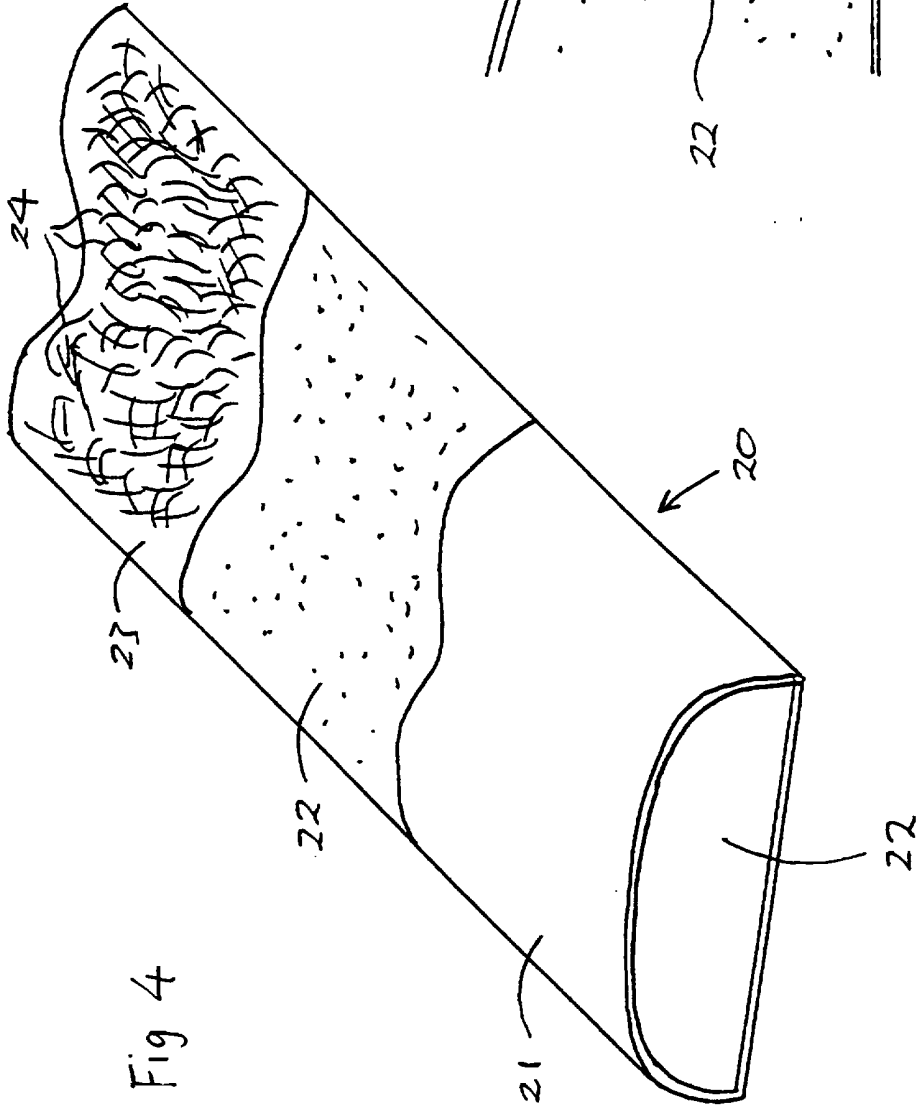


Fig 4

Fig 5

Protective Cap

Field of the Invention

This invention relates to a protective cap, and in particular to a light-weight, low cost, disposable protective cap.

5 Background to the Invention

Various forms of protective device to be worn on the head are known, for example, crash hats, cycling helmets, workmen's helmets etc.

The above-mentioned crash hats are all designed to prevent injury to the head when the wearer is engaged in a particular activity with which a risk of injury to the head is associated. In day to day living most people do not consider the risk of injury to the head from falling over for example, to be great enough to warrant wearing protective headgear. However, certain members of society are more vulnerable to head injury than others. Those members could include children, the injured, the elderly and the infirm. These people often lack balance or do not consider the danger posed by certain objects encountered during day-to-day life, for example, an infant may not realise that a hard slippery floor is dangerous, and that if the infant were to fall on the floor the result might be a serious head injury.

Attempts have been made to provide protective headgear to be worn by children in order to lessen the effects that a bump on the head might cause.

20 In US 4646367 a so called "tumbling cap" is described. The device consists of an elastic headband with a perimeter slightly smaller than that of the wearer's head. Pads are mounted on the outside of the headband at closely spaced intervals. The pads absorb shock when the child bangs his head against an object, for example a floor or a wall.

25 One problem associated with US 4646367 stems from the manner in which it is held on to the wearer's head. In order for the device to be held on to the head securely, because in children's play whilst skipping, jumping and running, it must fit the head relatively tightly. However, if it is a tight fit it is likely to aggravate the wearer. Conversely, if it is too slack it could easily fall down to cover the eyes, nose and/or mouth, or rest around the wearer's neck. If this were to happen to a child and if the

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child were playing the protective headband may become entangled around an object and throttle the child.

In EP 0638249 a helmet is described. The helmet is made from impact resistant foam which is encapsulated in a textile fabric material providing inner and outer surfaces of the helmet. The helmet is provided with a chin-strap.

The helmet described in EP0638249 also suffers from problems. The chin strap could become entangled on a protruding object or to be pulled by another child from the rear of the wearer and hurt the wearer's neck or worse still result in throttling. In hot weather the helmet would cause the wearer's head to become hot, and would therefore aggravate the wearer. Furthermore, the helmet would be expensive to manufacture.

It would therefore be desirable to provide a protective cap which would not suffer from the disadvantages suffered by the presently available protective headgear.

It has also been noted that the incidence of head lice in school children has increased. It would be desirable to provide a cap which would be effective in controlling this and other similar or associated head problems.

Summary of the Invention

The invention provides a disposable protective cap comprising a crown piece, a shock absorbent member extending around the fore, the sides and the rear of the head, and means to attach the shock absorbent member to the crown piece.

The shock absorbent member may be releasably attachable to the crown-piece.

The crown piece may comprise a plurality of strips and a crown-piece band, each strip extending from one side of the crown-piece band to the other. The strips may be arranged in cruciform when viewed in plan.

The strips and/or the crown-piece band may be formed from a lightweight material such as a plastics material. Each strip and/or the crown-piece band may be formed from a number of layers of lightweight material, and preferably, the lightweight material comprises two plastics materials, and more preferably, the two plastics materials are dissimilar. Advantageously, each strip and/or crown-piece band is formed from two layers of dissimilar plastics, the outer layer being a plastics film, which may be per-

forated, and the inner layer being formed from a woven or non-woven plastics material, for example a non-woven spin bonded plastics material.

The crown-piece may be provided with means for adjustment of the size of the crown-piece so that the crown-piece may fit differently sized and shaped heads. The means for adjustment may comprise at least one elasticated portion. At least one elastic thread may be provided in the crown-piece band and/or strips. The elastic thread may be stitched into the crown-piece band and/or strips. The elastic thread may extend fully around the circumference of the crown-piece band and/or the full length of the strips.

10 Preferably, the crown-piece is disposable.

In one embodiment of the invention the crown-piece is sterile. In another embodiment of the invention the crown-piece or a part thereof is medicated.

Advantageously, the shock absorbent member is in the form of a belt, the free ends thereof being provided with joining means, which joining means may comprise a hook and claw arrangement or sticky elements. The belt may be of uniform or non-uniform thickness along the length thereof. Suitably, the end portions of the belt are thinner than the middle portion thereof. The belt is suitably arranged on the crown-piece so that the end portions of reduced thickness are to the rear of the head, the portions overlapping to provide a member of substantially uniform thickness when attached to the crown-piece.

The width of the shock absorbent member may not be uniform around the circumference thereof. Preferably, the member has wider regions positioned to align with the ears and/or temples when the cap is in use. Apertures may be provided in the said wider portions to permit sound to pass to the ear of the wearer.

25 The shock absorbent member may comprise at least two layers. Advantageously, the shock absorbent member comprises three layers, an inner layer formed from a smooth fabric, an intermediate layer formed from a compressible material, such as wood or fluff pulp, flocking or foam, and an outer layer which may be formed from a plastics material. The plastics material may be a plastics film. Preferably, at least one surface of the plastics film is smooth and can easily be wiped clean. The inner layer may comprise a woven or non-woven plastics material, for example a non-woven spin

bonded plastics material. One or more of the said layers may be sterile. Suitably, one or more of the said layers is medicated.

The intermediate layer may be liquid absorbent, and preferably the inner layer is permeable to liquids.

5 The attachment means to attach the shock-absorbent member to the crown piece may comprise at least one hook and claw fastener and/or at least one sticky tab.

The cap may be embellished with a design such as a picture of a cartoon character, a racing car, or flowers to encourage children to wear the cap. The design may be provided on the outside of the shock absorbent member and/or the crown-piece.

10 The cap of the invention is easy to wear and stays on the head during most everyday activities performed by a child. However, this is done without the need for a chin strap which can in itself pose a danger, and without the need for the cap to fit tightly on to the head of the wearer. The provision of a crown-piece prevents the shock absorbent member from falling down to rest around the eyes, nose, mouth or neck of the
15 wearer. Additionally, because the crown-piece is made from a very lightweight and cheap material it can be disposed of each day, whereas the shock absorbent member may be disposed of every one to two weeks. By disposing of the crown-piece each day the risk of pests, e.g. head lice, building up in the cap is minimal. Furthermore, the crown-piece and/or the shock absorbent member may be medicated. The fact that the
20 cap is light-weight means that the cap of the invention is less likely to annoy the wearer than a cap of the prior art. The cap is made from materials which can withstand the forces exerted thereon during a knock, but which would break if the cap were to become entangled with another object. The cap may come off the wearer's head after a knock, but this is not detrimental because the types of fall that this cap is intended to
25 protect against would not involve the wearer rolling and banging his or her head numerous times, as might happen in a motorcycle accident.

The cap of the invention is not intended to protect against heavy blows in the manner that a crash hat would, rather it is designed to diminish the effects of small impacts that a child might otherwise endure in everyday living.

30 The cap may have applications for adults; for example it may be placed on the head of a person who has head wounds. The cap would provide a slight cushion against

a hard surface and could absorb a small amount of blood escaping from the wounds. The crown piece and/or shock absorbent member may be medicated to treat the wounds. If the head wounds are more serious, the cap could be used to hold a dressing in place, and at the same time provide a slight cushion against a hard surface. It would be advantageous to hold a dressing in place using a cap of the invention rather than a bandage because it is not necessary to move the head of the wearer many times, as an attendant must do if a bandage is being wrapped around the head to hold the dressing in place.

Brief Description of the Drawings

10 In the drawings which illustrate exemplary embodiments of the protective cap according to the invention:

Figure 1 is a schematic representation of a child wearing the crown-piece of a cap according to the invention;

15 Figure 2 is a schematic representation of a shock absorbent member for attachment to the crown piece shown in Figure 1;

Figure 3 is a schematic representation of another type of shock absorbent member for attachment to the crown piece shown in Figure 1;

Figure 4 is a cut-away section through the material of the member shown in Figure 3; and

20 Figure 5 is an exploded cross-sectional view of a corner of the member illustrated in Figure 4.

Detailed Description of the Drawings

Referring now to Figure 1, there is shown a crown piece 1 mounted on a child's head. The crown piece 1 comprises a crown-piece band 2 and strips 3, 4 extending from one side of the crown-piece band to the other. The crown-piece band 2 and the strips 3, 4 each comprise two layers of dissimilar plastics materials bonded or fused together. The outer layer is a smooth plastics film, and the inner layer is a non-woven spin bonded plastics material. The broken lines 5 represent elastic and/or cotton threads which extend around the crown-piece band 2 and along the length of each strip 3, 4. The elastic threads 5 are thin and are only sufficiently strong to make the crown-piece band 2 and strips 3, 4 conform to the shape of the wearer's head. The elastic

threads 5 do not exert a significant gripping force on the head of the wearer. In the Figure 1, the central thread may be an elastic thread, and the outer threads may be cotton threads, or vice versa, the cotton threads providing reinforcement.

A plurality of fasteners 6 is attached to the outside of the crown-piece band 2.
5 The fasteners may be sticky tabs, or part of a hook and claw attachment means (Velcro®). The fasteners 6 allow a shock absorbent member to be attached to the crown-piece band 2.

Referring now to Figure 2, there is shown a shock absorbent member 7. The member comprises a belt 8. The ends 10, 11 of the belt 8 are thinner than the rest of
10 the belt. This is so that the forehead and the sides of the head are fully protected, and so that the region to the rear of the head where the ends of the belt attach one to the other are not unduly bulky. It can be seen that the ends 10 and 11 are arranged to overlap and that the thickness of the belt in the overlapping region is approximately the same as the thickness of the rest of the belt. This means that a substantially equal
15 amount of protection is provided for the full circumference of the head. The free end 10 of the belt 8 is shown having a fastener 12 attached thereto. The fastener is in the form of sticky tabs. Alternatively, the fastener may comprise part of a hook and claw attachment means (Velcro®).

It can also be seen from Figure 2 that the belt 8 is provided with two down-
20 wardly extending portions 9. These portions protect the temple and/or the ear when the belt 8 is attached to the crown-piece band 2. The inside of the belt 8 may be provided with attachment means to co-operate with the crown-piece band 2 or attachment means provided thereon. The attachment means provided on the inside of the belt 8 may be in the form of sticky tabs or part of a hook and claw attachment means (Velcro
25 ®). The downwardly extending portions may be provided with apertures to allow sound to pass through to the ear of the wearer.

Referring now to Figure 3, there is shown a shock absorbent member 15 in the form of a belt 16. The free ends 17, 18 of the belt are of reduced thickness compared to the rest of the belt, for the reasons explained with reference to Figure 2. The free
30 end 17 is provided with a fastener 19 which may be similar to the fastener 12 described with reference to Figure 2. The inside of the belt 15 may be provided with attachment

means to co-operate with the crown-piece band 2 or attachment means provided thereon. The attachment means provided on the inside of belt 17 may be in the form of sticky tabs or part of a hook and claw attachment means (Velcro ®).

5 Figures 4 and 5 illustrate the material used to make the shock absorbent member. The material 20 comprises an outer layer 21 which is a plastics film that is substantially impermeable to liquid. The inner layer 23 is non-woven spin bonded plastics material which is formed from many discreet plastics filaments 24 spin bonded together. Between the two plastics layers 21, 23 there is sandwiched a layer of material 22 having shock absorbent properties. It can be seen that the inner layer 23 and the outer layer 10 21 are fused together at their edges to envelop the shock absorbent layer 22. The material 22 comprises wood or fluff pulp. The material 20 is used in the manufacture of disposable nappies. The inner layer does not irritate the skin and allows moisture to pass therethrough; the intermediate layer provides padding. The outer layer is impermeable to liquid and prevents moisture entering or leaving the intermediate layer 22. 15 This type of material is therefore particularly suitable for use as a shock absorbent member for the cap of the invention, because the inner layer 23 which sits against the head of the wearer will not irritate the scalp and will allow sweat to pass through into the intermediate layer 22. The intermediate layer 22 is sufficiently thick and resilient to diminish the effects of a blow to the head. The outer layer 21 prevents the ingress of 20 moisture into the intermediate layer 22, and the cap can therefore be worn when children are playing outside in light rain. The outer layer also protects the intermediate layer 22 from being damaged, for instance if a child were to brush past an object having a rough surface, unprotected the intermediate layer may be damaged, but the smooth outer layer would slide over such a surface.

CLAIMS

1. A disposable protective cap comprising a crown piece, a shock absorbent member capable of extending, in use, around the fore, the sides and the rear of the head, and attachment means to attach the shock absorbent member to the crown
5 piece.
2. A disposable protective cap according to Claim 1, wherein said attachment means for attaching the shock absorbent member to the crown-piece are releasable means.
3. A disposable protective cap according to Claim 1 or 2, wherein the
10 crown piece comprises a plurality of strips and a crown-piece band, each strip extending from one side of the crown-piece band to the other.
4. A disposable protective cap according to Claim 3, wherein the strips are arranged in cruciform when viewed in plan.
5. A disposable protective cap according to Claim 3 or 4, wherein the
15 crown-piece band and/or the strips are formed from a lightweight plastics material.
6. A disposable protective cap according to Claim 3, wherein the crown-piece band and the strips are formed from a number of layers of lightweight material.
7. A disposable protective cap according to Claim 6, wherein the lightweight material comprises two dissimilar plastics materials.
8. A disposable protective cap according to Claim 6 or 7, wherein the
20 outer layer is a plastics film and the inner layer is formed from a textile material.
9. A disposable protective cap according to Claim 8, wherein the inner layer is formed from a non-woven textile material.
10. A disposable protective cap according to Claim 9, wherein the inner
25 layer is a non-woven spin bonded plastics material.
11. A disposable protective cap according to any preceding claim, wherein the crown-piece is provided with means for adjustment of the size of the crown-piece so that the crown-piece may fit differently sized and shaped heads.
12. A disposable protective cap according to Claim 11, wherein the means
30 for adjustment comprises at least one elasticated portion.

13. A disposable protective cap according to Claim 12, wherein at least one elastic thread is provided in the crown-piece band.

14. A disposable protective cap according to Claim 12 or 13, wherein each one of the strips comprises at least one elastic thread.

5 15. A disposable protective cap according to Claim 13 or 14, wherein the elastic thread is stitched into the crown-piece band and/or the respective strip.

16. A disposable protective cap according to Claim 15, wherein the elastic thread extends fully around the circumference of the crown-piece band.

10 17. A disposable protective cap according to Claim 15, wherein each said elastic thread extends the full length of the respective strip.

18. A disposable protective cap according to any of Claims 6 to 10, wherein at least one of said layers is formed of a sterile material.

19. A disposable protective cap according to Claim 18, wherein at least one of said layers is medicated.

15 20. A disposable protective cap according to any of Claims 6 to 10, 18 and 19, comprising a liquid absorbent intermediate layer, and wherein the inner layer is permeable to liquids.

20 21. A disposable protective cap according to any preceding claim, wherein the attachment means to attach the shock-absorbent member to the crown piece comprise at least one hook and claw fastener, or at least one adhesive tab.



Application No: GB 9809127.5
Claims searched: 1-21

Examiner: Richard Collins
Date of search: 29 April 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.Q): A3V

Int CI (Ed.6): A41D 20/00; A42B 1/08, 3/00, 3/04, 3/10, 3/32; A63B 71/10.

Other: Online WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	US 5437064 A (HAMAGUCHI) figure 3.	1-5,11,12,21
Y	US 5337420 A (HAYSOM) figure 1.	1-5,11,12,21
Y	US 4698852 A (ROMERO) figure 1.	1-5,11,12,21
Y	US 4646367 A (HASSEN) figure 1.	1-5,11,12,21

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
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