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(54) Miltary protective helmet

(57) The invention relates to a military protective helmet consisting of an impact resistant laminated fabric shell which includes an internal shock absorption device as well as a strap set that may be attached to the shell 1, using some pieces that are stapled to the helmet 1 by pressure on the sides of the piece. The invention is characterized in that the piece is flat and V-shaped with a higher side, which is in contact with the internal face of the helmet shell 1, which has a drill hole 7 at the top where the set of internal lining and strap set 8 of the helmet is attached.

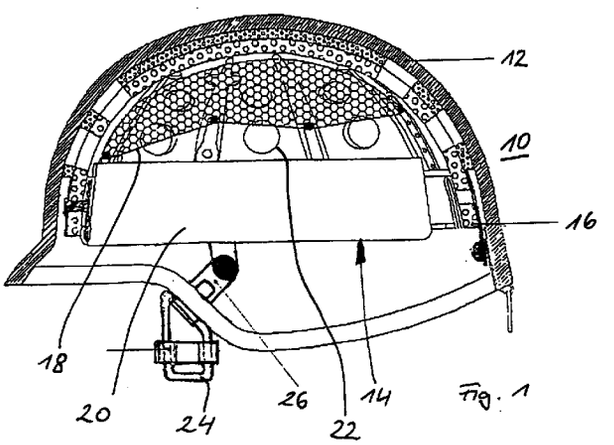

Fig. 1

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Description

[0001] The present invention relates to a military protective helmet as defined in the introductory portion of claim 1.

[0002] Current military protective helmets generally comprise a shell of plastics material or laminated plastic capable of withstanding strikes, ballistic impact or the like, the shell being composed of a defined number of fabric layers in a resin matrix such as polyester, phenolic resin etc.,

[0003] Inside the shell there is provided a supporting basket including shock absorbing means and a suspension net and a head band, generally a leather band. This basket is firmly secured to the shell by means of holders. The helmet is also provided with a strap set including a chin and nape strap which are also fixed to the shell by means of buckles and fasteners. The free outer edge of the shell is trimmed with a padded band, especially a rubber band.

[0004] The basket with its shock absorbing means prevents the head of the soldier from coming in contact with the shell in case of impact. The military protective helmet is firmly held on the soldier's head via the strap set.

[0005] The holders serve to fasten the basket and the strap set to the shell and are each affixed to the shell by bolt-liner joints inserted into an associated bore in the shell.

[0006] Typically military helmets are provided with three holders for the basket and the strap set, two being fitted one on either lateral side of the helmet and the other to the rear.

[0007] Known helmet structures have the disadvantage of requiring relatively wide bores and bolt-liner joints to mount the holders in order to transmit applied forces and moments. This, however, impairs the ballistic and impact proof properties considerably as the laminated fabric will be damaged by the wide bore. In an area of approximately three centimeters around the bore the required ballistic proof property and the impact resistance or the like of the helmet are significantly reduced.

[0008] It is therefore an object of the present invention to improve a military protective helmet as defined in the introductory portion of claim 1 so as to overcome the cited drawbacks and to propose a secure fastening of the holder to the shell.

[0009] This object is achieved by the characterizing features defined in claim 1 in conjunction with the elements in the introductory portion.

[0010] The understanding underlying the invention is that a holder that grips around the outer edge of the shell and engages the shell on either side ensures a first attachment of the holder to the shell without having to cut right through the laminated fabric, thus substantially retaining the properties of the shell in this area.

[0011] According to the invention the holder for the basket and/or the strap set is, therefore, U-shaped in section, folds over the outer edge of the shell and engages the associated portion on either side of the shell.

[0012] Advantageously, the holder is connected to the basket but also to the strap set, so that the holder performs the dual function of fastening the strap set and the basket.

[0013] According to one embodiment of the invention the holder comprises grip means engaging the plastics material, especially the plastic laminate of the shell, in the form of pointed teeth or the like. These teeth extend substantially horizontally from the holder into the shell, so as to ensure optimum transmission of tangential forces from the shell to the basket and the strap set and vice versa.

[0014] For the same reason the grip means according to a further embodiment of the invention are arranged in mutual alignment on opposite sides.

[0015] In order to ensure uniform transmission of the forces on the holder from the basket and/or the strap set to the shell, the holder preferably firmly bears on to the inner surface and the outer surface of the shell, at least in some areas.

[0016] According to one embodiment of the invention the holder protrudes outwardly from the outer edge of the shell, so that the lower U-shaped area of the holder is adapted to receive the strap set. Preferably, the lower U-shaped area is formed to mate with the buckle of the strap set and the horizontal part of the U-shaped holder is V-shaped in section. A relatively simple construction can thus accommodate the strap set in the holder.

[0017] In order to affix the holder to the shell at yet another point, apart from the grip means, the holder and the shell each are provided with relatively aligned bores to be engaged by a pin which connects the two vertical walls of the U-shaped holder. These bores may thus be of much smaller dimensions than those in known military helmets, where the holder is affixed to the shell by means of a single bolt-liner joint inserted in a bore. The provision of a wide bore tends to degrade the properties of the shell in this area.

[0018] It is known to have the outer edge trimmend with a padded band, for example of rubber. According to an embodiment of the invention this padded band covers the related vertical portion of the U-shaped holder and is provided with an aperture to allow the lower U-shaped portion of the holder to pass through. As a result the lateral padding is maintained intact even in the area of the holder attachment.

[0019] In order to ease the attachment of the holder the vertical inner portion of the U-shaped holder extends further upward than the vertical outer portion of the U-shaped holder. The upper region of the inner portion of the U-shaped holder is provided with a recess to secure the basket.

[0020] According to an embodiment of the invention the vertical inner portion of the U-shaped holder above

the grip means is provided with a cutout, so that the grip means can be made from the material of the vertical wall by subsequent bending towards the shell.

[0021] Therefore, the holder can be manufactured as a onepiece thus reducing the cost of manufacture considerably.

[0022] Preferably the holder consists of metal, and is especially made of sheet metal.

[0023] Among others, the following advantages:

- Increases in the ballistic behaviour.
- Elimination of the parts that stick out of the helmet shell.
- Considerable decrease in weight due to elimination of elements.

[0024] Further advantages and features of the invention will be apparent from the following description of an embodiment of the invention with reference to the attached drawing in which

Fig. 1 is a schematic sectional elevation of a military protective helmet according to one embodiment of the invention;
Fig. 2 is a sectional view of the shell and the holder in Fig. 1;
Fig. 3 is a sectional view of the holder in Fig. 2, with the shell removed;
Fig. 4 is a side view of the holder in Fig. 3; and
Fig. 5 is a plan view of the holder in Fig. 4.

[0025] Referring to Fig. 1 there is shown in a schematic sectional view a military protective helmet 10. The military protective helmet 10 consists of a skull shaped shell 12 made up of a plastic laminate including a specific number of fabric layers embedded in a resin matrix such as polyester, phenolic and exhibiting defined ballistic and impact proof properties. Inside the shell 12 there is provided a suspended basket 14 which is provided with shock absorbing devices 16, a net 18 as well as a leather headband 20.

[0026] The shock absorbing devices 16, the net 14 and the headband 20 are interlaced by a strap spider 22 so as to form the basket 14.

[0027] The military protective helmet 10 is further provided with a strap set not shown in detail which is connected to either lateral side of the shell 12 respectively by means of a buckle 24 and a holder 26. The basket 14 is also connected to the holder, so that the holder 26 performs the dual function of fastening the strap set and the basket 14.

[0028] With reference to Figs. 2 to 5 the holder 26 will now be described in detail which, as mentioned above, is fixed on both lateral sides to the edge of the shell 12.

[0029] The holder 26 is substantially U-shaped in section and comprises two vertically extending legs 28 and 30. The leg 28 bears on to the outer surface of the shell 12 and the vertical leg 30 contacts essentially the inner surface of the shell 12.

[0030] Both vertical legs 28 and 30 are joined by a V-shaped horizontal part 32 of the U-shaped holder 26. The leg 30 is longer and extends further upwards other than the leg 28.

[0031] In the upper region of the leg 30 there is a bore 34. In addition the upper region of the leg 30 is rounded.

[0032] The two vertical legs 28 and 30 as well as the shell 12 are provided with a respectively aligned bore 36 to be engaged by a pin 37.

[0033] In the upper region of the leg 28 and the leg 30 there are several opposed pointed teeth arranged in the same horizontal plane which dig into the shell 12. These teeth 38 firmly secure the holder 26 to the shell 12. The legs 38 and 30 extend substantially downward from the teeth 38 and firmly bear on to the shell 12. The leg 32 protrudes below the outer edge 38 of the shell 12 and is adapted to receive the buckle 24.

[0034] A padded band 40 folds over the outer edge 38 of the shell 12 and is provided adjacent to the holder 26 with an aperture 42 to allow the lower portion 32 to pass through.

[0035] The basket 14 is connected to the upper bore 34 in the leg 28, preferably via a snap fastener.

[0036] The holder 26 is a onepiece part and fabricated in one operation. To achieve this, a cutout is made in the leg 30 during the manufacturing process so that the cut-out material can be used to form the teeth 38 by subsequent bending in the direction towards the leg 28. As a result the weight of the holder 26 can be reduced. The end of the leg 28 is defined by the teeth 38. The teeth 38, the bores 34 and 36 as well as the cutout 44 can easily be made by a machining process. In a subsequent step the holder is formed correspondingly.

[0037] To do this the holder 26 consists of metal and is fabricated from a sheet metal.

[0038] The invention is primarily characterized by the fact that the teeth 38 on the one hand dig into the shell 12 from the inside and from the outside which avoids severing the laminated fabric and on the other hand allow the holder to be firmly secured. The additional bore 36 can thus be kept much smaller than in current helmets.

[0039] In addition, the holder 26 is easy to manufacture and to mount and remains invisible from the outside in the area of its attachment to the shell as it is completely covered by the padded band 40. The ballistic proof properties of the military protective helmet remain thus substantially unaffected by the manner of attaching the holder, and the number of parts required can be reduced and accordingly the weight as well.

Claims

1. A military protective helmet consisting of an impact resistant laminated fabric shell which includes an internal shock absorption device as well as a strap set that may be attached to the shell (1), using

some pieces that are stapled to the helmet (1) by pressure on the sides of the piece **characterized in that** the piece is flat and V-shaped with a higher side, which is in contact with the internal face of the helmet shell (1), which has a drill hole (7) at the top where the set of internal lining and strap set (8) of the helmet is attached.

2. A military protective helmet according to claim 1, **characterized in that** on the lower side of the piece there is a folded end with a toothed surface (9), which is driven into the helmet shell (1) and on the other side at a greater height, there is a surface (11) where there is a fold also with a toothed surface (9), like on the previous side, which is driven by pressure into the helmet shell (1) and on both sides, some drill holes (6) are made to slip through the pin that crosses the shell (1).

3. A military protective helmet according to claim 1 or 2, characterized in that the piece has a V-shaped end and the vertex rounded, where a buckle (10) is placed, which holds the whole helmet (1) strap set.

4. A military protective helmet comprising a skull shaped shell (12) of plastics material, especially plastic laminate, capable of withstanding strikes, ballistic impact or the like, with a basket (14) connected to the shell (12) by means of a holder (26), and with a strap set also connected to the shell (12) by means of a holder (26) to keep the helmet stable on the soldier's head, **characterized in that** the holder (26) for the basket (18) and/or the strap set is U-shaped in section and grips around the outer edge (38) of the shell and engages the shell (12) on either side.

5. A military protective helmet according to claim 4, wherein the holder (26) is connected to both the basket (14) and to the strap set.

6. A military protective helmet according to claims 4 or 5, wherein the holder (26) comprises grip means (38) such as teeth or the like, which dig into the plastics material, especially into the plastic laminate.

7. A military protective helmet according to claim 6, wherein the grip means (38) extend substantially horizontally from the holder (26) towards the shell (12).

8. A military protective helmet according to any one of the preceding claims, wherein the grip means (38) are arranged mutually opposed and level with one another.

9. A military protective helmet according to any one of the preceding claims, wherein the holder (26) firmly bears on to the inner surface and the outer surface of the shell (12), at least over defined areas.

10. A military protective helmet according to claims 5 to 9, wherein the holder (26) extends downwardly past the outer edge (38) of the shell so that the lower U-shaped portion of the holder (26) is adapted to accommodate the strap set.

11. A military protective helmet according to claim 10, wherein the U-shaped portion mates with a buckle (24) of the strap set, and the horizontal portion (32) of the U-shaped holder (26) is preferably V-shaped in section.

12. A military protective helmet according to any one of the preceding claims, wherein the holder (26) and the shell (12) each have mutually aligned bores (34, 36) to be engaged by a pin (37) which connects both vertical walls (28, 30) of the U-shaped holder (26).

13. A military protective helmet according to any one of the preceding claims, wherein a padded band (40) which folds over the outer edge (38) is provided and which covers part of the vertical portion (28, 30) of the U-shaped holder (26) and has an aperture (42) to allow the lower portion of the holder (26) to pass through.

14. A military protective helmet according to any one of the preceding claims, wherein the inner wall portion (30) of the U-shaped holder (26) is longer than the outer wall portion (28) to extend further upwards.

15. A military protective helmet according to claim 14, wherein the upper region of the inner wall portion of the U-shaped holder (26) is provided with a cutout (44) for fastening the basket (14).

16. A military protective helmet according to any one of the preceding claims, wherein the holder (26) is a onepiece part.

17. A military protective helmet according to claim 16, wherein the upper region of the inner wall portion of the U-shaped holder (26) has a cutout (44) above the grip means (38) so that the grip means (38) can be made from the vertical wall material by subsequent bending towards the shell (12).

18. A military helmet according to claim 17, wherin the holder (26) consists of metal and is manufactered from sheet metal.

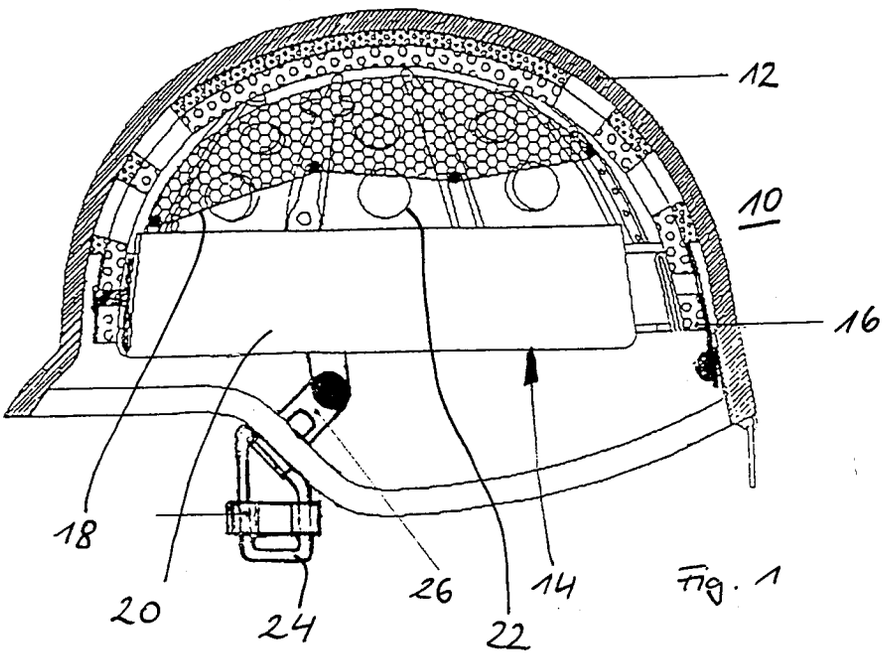

Fig. 1

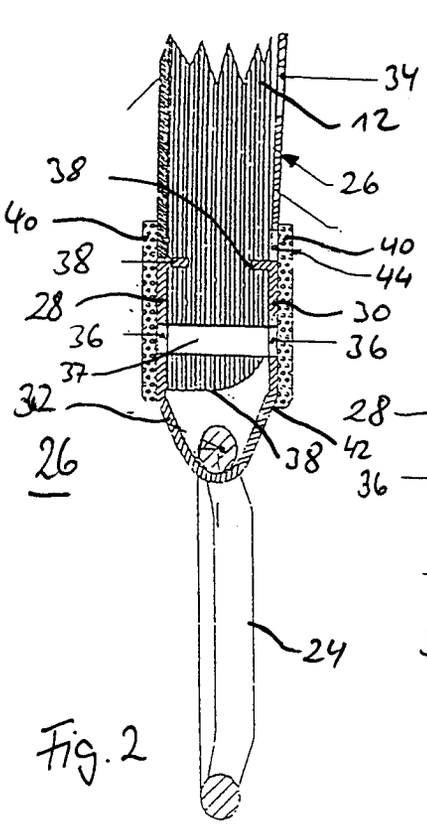

Fig. 2

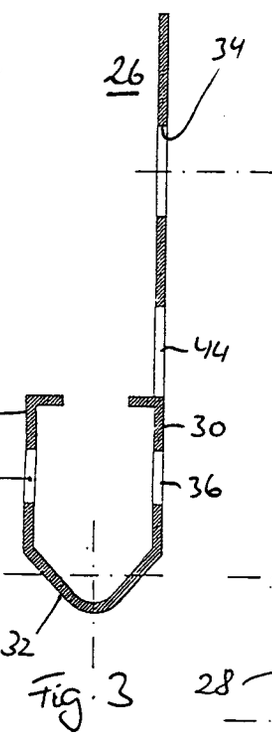

Fig. 3

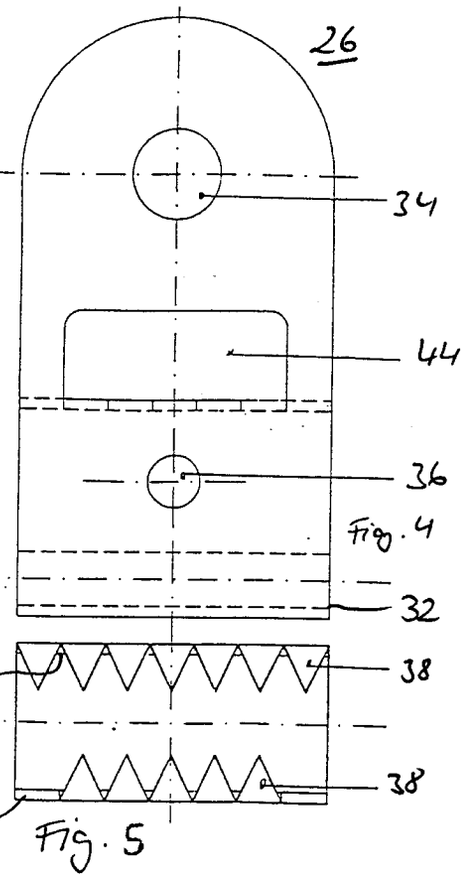

Fig. 4

Fig. 5