Feb. 14, 1956 J. KREINIK 2,734,197

PLASTIC RAIN CAP COVER, MOLDED

Filed June 26, 1953

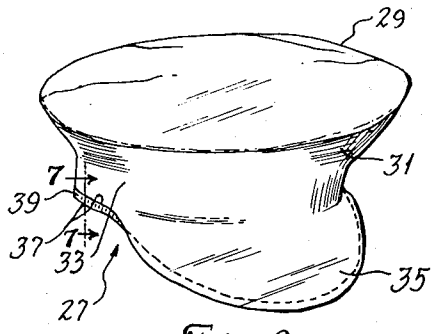



Fig. 2

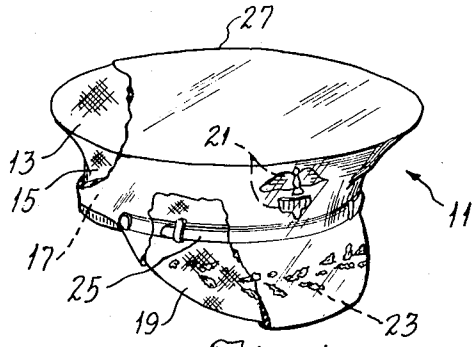



Fig. 1

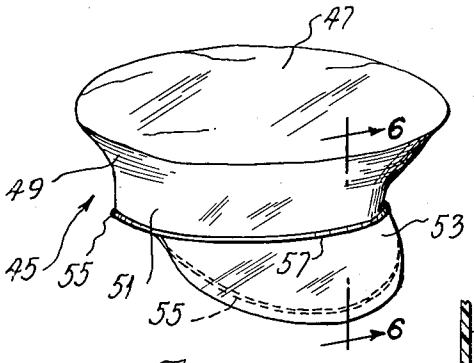



Fig. 5

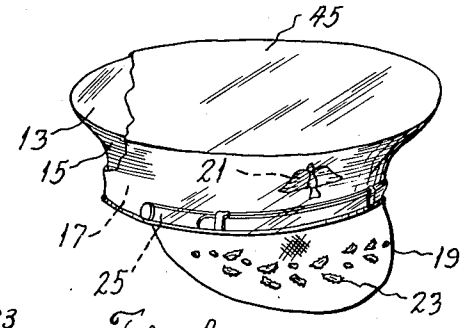



Fig. 4

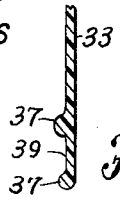



Fig. 7

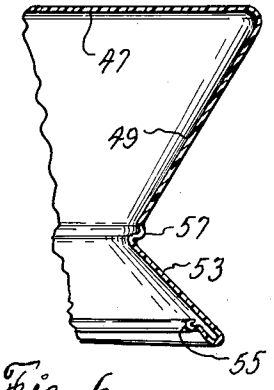



Fig. 6

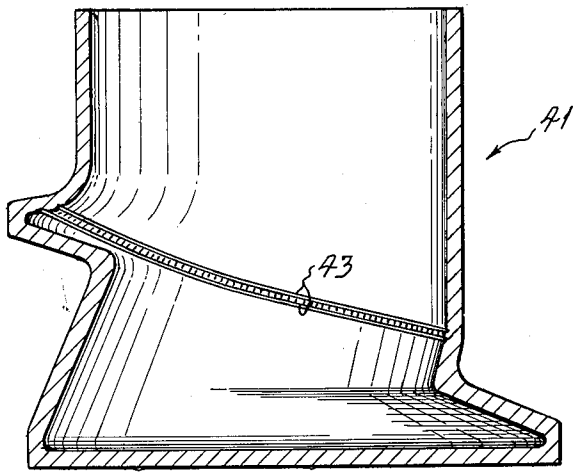



Fig. 3

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# PLASTIC RAIN CAP COVER, MOLDED

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2 Claims. (Cl. 2—187)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The present invention relates to protective covers employed in connection with caps or other head coverings and more particularly to molded one-piece waterproof cap coverings comprising transparent, elastic plastic material.

Since the start of World War II, attempts have been made to design and develop a satisfactory type of transparent rain cover that would be tough, durable and transparent. Initially, sheet fabrics woven of rayon, acetate, silk and cotton coated with various waterproofing solutions were used. However, such fabrics were low in tensile strength and excessively perishable. Then too, the coatings proved unsatisfactory under weathering and aging tests.

With the development and production of thin films of vinyl copolymers, it was possible to stitch a plurality of panels of such water-resistant material together to form a hat covering. The stitching process proved impracticable because the film was punctured as the stitches were formed and the seams were unable to withstand the required strain in use. Means were devised for reinforcing the seams, such as, by doubling the edges before sewing or by stitching the seams and then cementing a strip of film tape over the seams, but such means resulted either in no appreciable increase in seam efficiency or costly production techniques.

Other protective covers composed of unsupported plastic film using elastic to bind the edges were devised but were not adequate because the elastic shirred and puckered the entire cover. The electronic-seal-welding technique was employed to overcome the disadvantages of sewing and stitching but this method did not prove too satisfactory because snap fasteners or zippers used to permit adjustment for proper fit of the coverings were susceptible of tearing stresses at the point of installation.

To overcome the above disadvantages, a new and better method was devised for manufacturing water-proof cap coverings. An object of this invention is to mold a one-piece protective water-repellent cap cover or other head covering that is transparent.

Another object of the invention is to provide a waterproof protective cap cover that possesses chemical and physical stability, clarity, flexibility and toughness.

Still another object of the invention is to provide a protective cover for a cap or other head covering that can be snugly placed on such cap or other head covering, or removed therefrom, quickly and easily.

A further object of the invention is to provide a protective cover for a cap or other head covering that is easily and inexpensively molded, light in weight and yet durable.

A still further object of the invention is to provide a one-piece transparent protective covering for a cap whereby an insigne or other device of rank, and the like, on said cap will be clearly visible at all times.

These and other objects of the invention and the various features and details of construction thereof are hereinafter more fully set forth and described with reference



to the accompanying drawings in which like numbers refer to like parts:

Fig. 1 is a view in perspective of a uniform cap carrying an insigne on both the body and visor thereof and provided with a protective covering, the latter being partly broken away.

Fig. 2 is a perspective view of the protective covering shown on such uniform cap in Fig. 1.

Fig. 3 is a cross-section view, in elevation, of a mold used for molding a protective covering.

Fig. 4 is a view in perspective of another embodiment of a protective covering in position on a uniform cap carrying an insigne on the body thereof.

Fig. 5 is a perspective view of the protective covering shown on such uniform cap in Fig. 4.

Fig. 6 is a view of a portion of the protective covering taken along line **6—6** of Fig. 5; Fig. 7 is an enlarged view of a portion of the protective covering taken along line **7—7** of Fig. 2.

In Fig. 1 there is shown one type of uniform cap with a protective covering thereon, the combination being indicated by reference numeral **11**. Such uniform cap is of the usual construction and consists of a crown **13**, side panels **15**, a head-band portion **17**, and a visor **19**. Attached to the front portion of such uniform cap is an insigne **21**, which together with the leaf pattern **23** decorating said visor **19**, serve to indicate both rank and service branch of the wearer. The crown **13**, side panels **15** and the head-band portion **17** are usually formed of fabric stitched together and stretched over a frame, not shown, providing the proper shape for said cap. Visor **19** is suitably attached to the frame beneath the head-band portion **17**. A pair of looped straps **25** provided on the cap can be drawn apart and placed beneath the chin of a wearer to hold said cap in place during gusty weather.

In order to protect the uniform cap from snow, rain, sleet, etc., and yet permit recognition of the wearer's rank, a molded one-piece transparent protective covering **27**, as shown in Fig. 2, is provided. Said covering **27** comprises a circular crown portion **29**, an inwardly-sloping side portion **31** of similar shape to side panels **15** of cap **11**, a circular head-band portion **33** and a visor-shaped pocket section **35**. The outermost edges of head-band portion **33** and visor pocket **35** are reinforced by two beads **37** separated by a small band **39** (see Fig. 7).

The protective covering **27** is easily fitted over a uniform cap. No slide fasteners or other means for fitting the cover snugly about the cap are necessary because said cover is designed to be form-fitting when placed on the cap. The inherent properties of the materials used in molding the cover provide sufficient elasticity to hold the cover to the cap snugly and smartly.

Based on research and investigation and also on requirements that the protective cover possess chemical and physical stability, clarity, flexibility and toughness, it was determined that the vinyl copolymers are best suited for molding protective head coverings. One qualitative formula that yields the above desired qualities comprises Geon 121, di-iso-octyl phthalate, Paraplex G–61, calcium stearate, and mixed stearates-oleates.

In general, the protective cap covering can be made by using the slush molding technique. A mold **41** is constructed by making a wax replica of an assembled officer's cap, thereby faithfully reproducing the cap in all respects with the exception that the underside surface of the visor in such replica forms an angle of forty-five degrees with the upper surface (see Fig. 3). The visor of the cap frame actually has the lower surface parallel to the upper surface. This modification is necessary to permit the run-off of excess material in molding. The wax model is then super-cooled and

coated with a metallic silver under high vacuum conditions. Then the coated wax is immersed in a copper plating bath thereby forming a copper mold around the wax mold. Once the copper mold is formed and set, the wax is melted out leaving a female mold. The mold is then cleaned and filled with a silver-plating solution to plate an additional quantity of silver on the inside surface of the mold. The mold is again cleaned and polished. The beaded edges **37** on head-band portion **33** and visor portion **35** are formed during molding operation in channels **43** of mold **41**.

Another embodiment of the novel protective cap cover is shown in Fig. 4 in fitted position on a uniform cap; the details of said covering are shown more clearly in Figs. 5 and 6. Covering **45** comprises a circular crown portion **47**, an inwardly-sloping side portion **49**, a circular head-band portion **51** and a visor-shaped pocket section **53** similar to the corresponding portions of covering **27**. The outermost edges of head-band portion **51** and visor section **53** are reinforced by a double bead **55**. Also, a double bead **57** is formed at the junction of said head-band portion and said visor section. Said double bead **57** permits removal of said visor pocket **53** from head-band **51** (e. g. by cutting along the lower edge of said double bead) without destroying the covering when worn over a cap not requiring protection of the visor from the elements.

The method and material employed in molding said covering **45** is similar to those employed for molding covering **27**. By slight modification of mold **41**, the formation of the double bead can be easily accomplished.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.



I claim:

1. A protective cap cover for visored caps comprising a transparent, elastic plastic material having a crown portion, an inwardly sloping side portion, a head-band portion and a visor portion of the general shape of a visored cap, and a double bead of plastic material coextensive with one edge of said head-band and visor portions, and forming a juncture therebetween, said crown, side, head-band and visor portions and said double bead molded together to form a seamless one-piece unit, whereby said visor portion can be severed from the cover along the lower edge of said double bead without destroying the crown portion of said cover.

2. A protective cap cover for visored caps comprising a transparent, elastic plastic material having a crown portion, an inwardly sloping side portion, a head-band portion and a visor portion of the general shape of a visored cap, wherein one edge of said head-band and visor portions are reinforced, and a double bead of plastic material coextensive with one edge of said head-band and visor portions, and forming a juncture therebetween, said crown, side, head-band and visor portions and said double bead molded together to form a seamless one-piece unit, whereby said visor portion can be severed from the cover along the lower edge of said double bead without destroying the crown portion of said cover.

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