

Jan. 16, 1962

R. L. ARCHBOLD

3,016,541

SAFETY HAT

Filed July 1, 1959

2 Sheets-Sheet 1

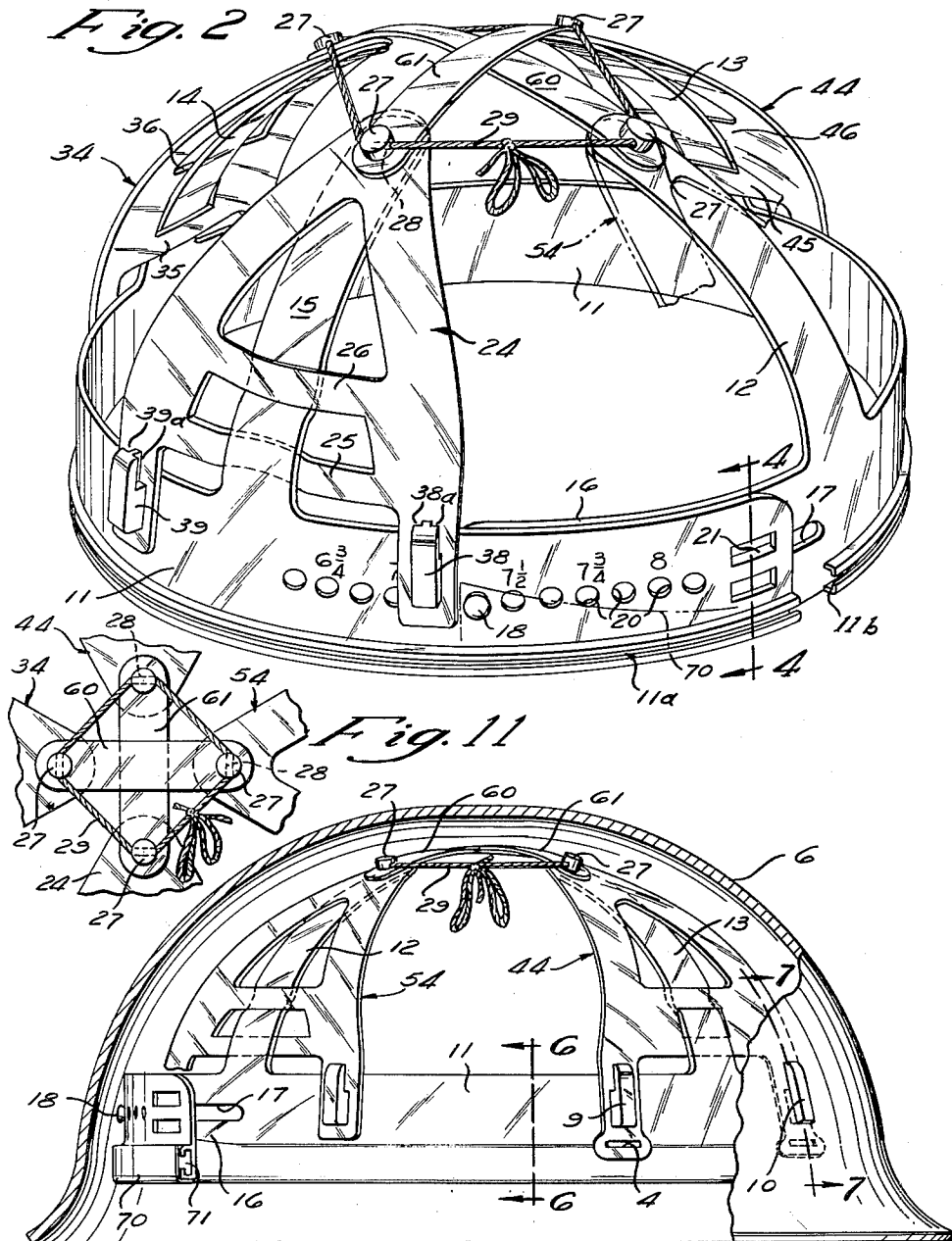


Fig. 1

INVENTOR.

RALPH L. ARCHBOLD

BY

RICHEY, MCNENNY & FARRINGTON

Donald W. Farrington

ATTORNEYS

Jan. 16, 1962

R. L. ARCHBOLD

3,016,541

SAFETY HAT

Filed July 1, 1959

2 Sheets-Sheet 2

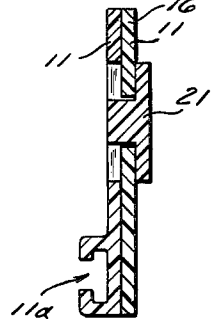
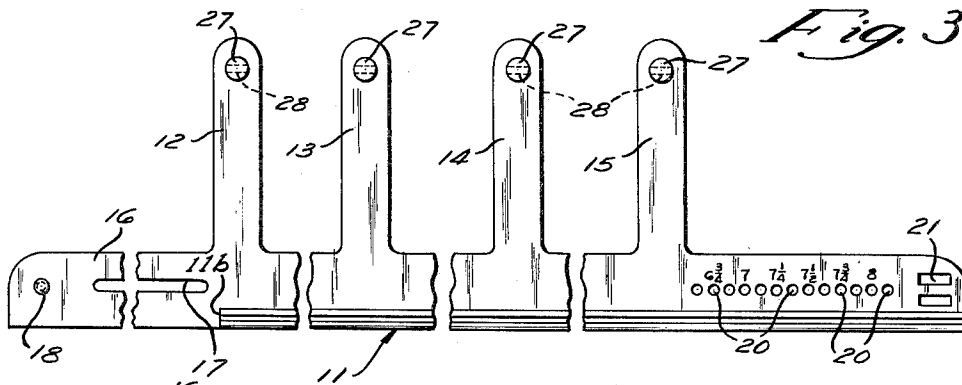


Fig. 4

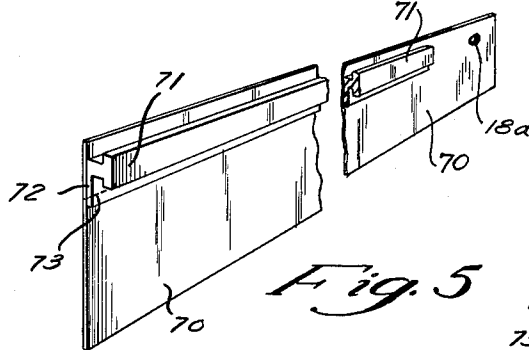


Fig. 5

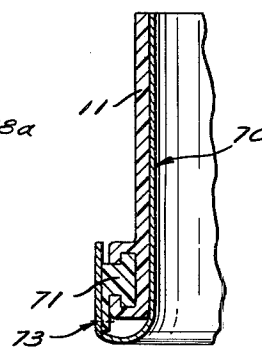


Fig. 6

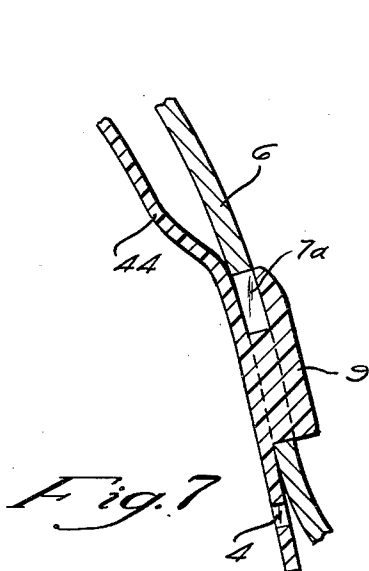


Fig. 7

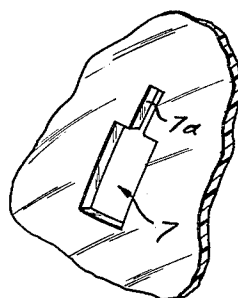


Fig. 8

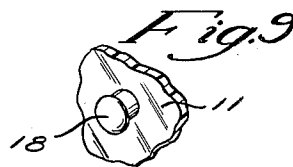


Fig. 9

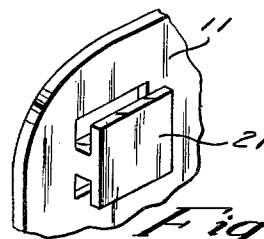


Fig. 10

INVENTOR.

RALPH L. ARCHBOLD

BY

RICHEY, MCNENNY & FARRINGTON

Charles W. Farrington

ATTORNEYS

1

3,016,541

SAFETY HAT

Ralph L. Archbold, Euclid, Ohio, assignor to White Sewing Machine Corporation, Lakewood, Ohio, a corporation of Delaware

Filed July 1, 1959, Ser. No. 824,377

8 Claims. (Cl. 2—3)

This invention relates to a safety headgear or head protective equipment, and more particularly to an improved harness or cradle attachment adapted to be detachably secured to a hard hat or helmet and including a sweatband adapted to be replaced without removing the suspension from the hat.

Numerous types of safety headgear are available today comprising a protective hat provided with a harness for supporting the hat upon the head of a wearer. Some of such prior art devices employ a collarbutton type fastener for securing the harness onto the hat, the buttons having inwardly projecting heads which may exert pressure on the relatively soft or flexible headband material and against the wearer when the hat is forced against the headband due to impact from a falling object or a sudden jolt. Also in certain prior art devices the sweatband is sewed or otherwise permanently secured to the headband portion of the harness requiring a new harness or at least the headband portion thereof when it is desired to replace a soiled or damaged sweatband. Replacement of a sweatband in such prior art devices requires detachment and subsequent attachment of the harness relative to the hat which is time consuming.

I have devised a harness, preferably formed of flexible material such as a polyethylene plastic, and comprising inverted generally V-shaped members easily attached to and detached from the hat by locking plugs formed on the outer face of the members which plugs engage holes in the hat whereby when the hat is forced against the headband only a relatively broad flat surface of the members contact the headband. The headband is formed of similar plastic material and has integral fingers extending upwardly through openings in the members, the fingers being attached to the upper ends of said members by a drawstring. To achieve stability of the hat relative to the harness certain of said openings restrain shifting movement of the fingers and other openings permit limited movement of the fingers for adjustment of the headband as desired. The sweatband is detachably secured to the headband portion of the harness by a tongue and groove type arrangement whereby the sweatband may be attached and removed without disconnecting the harness from the hat.

It is the prime object of headgear of the type covered by this application to protect the individual wearing the hat or helmet from injury due to falling objects and the like. The problem which has confronted designers of this type of headgear is that of retaining the protective features and, at the same time, providing headgear which is ventilated and comfortable to the wearer and one wherein the harness may be easily adjusted to fit the head of the wearer. Most harnesses for headgear of the type described support the rigid hat or helmet in spaced relation to the head of the wearer. An acceptable harness should be constructed and arranged so as to permit some limited movement of the hat relative to the head of the wearer in response to impact. Certain of the prior art hats include a harness having depending peripherally spaced fingers wherein some of the fingers are connected to the crown of the hat and other fingers are connected to the headband. Such hats are characterized by a large number of separate locking pins extending normal to the head of the wearer for securing the parts in place. In such prior art designs four pins have been used for con-

2

nection with the headband and eight pins for connection to the crown. Such separate fastening pins present a costly problem in assembly and the rigid pins normal to the head of the wearer present a potential source of injury to the wearer. Accordingly it is an object of my invention to provide a harness which will retain the comfort and safety features of the prior art devices and one wherein no fastening pins normal to the head of the wearer are employed.

Another object of the invention is to provide an improved harness including a sweatband, the harness being adapted to be detachably secured to a hard hat or the like, and the sweatband removed from the harness without detaching the harness from the hat.

Another object of the invention is to provide a harness of the above type which is economical to manufacture.

Another object of the invention is to provide a harness of the above type which can be easily adjusted to different head sizes.

Other objects of the invention relating to safety and efficiency will become apparent from the following description and drawings wherein:

FIG. 1 is an elevation with parts in section showing the harness as applied to a hat;

FIG. 2 is a perspective view of the harness showing the hat supporting members as arranged within the hat when in use;

FIG. 3 is an elevation showing the headband forming a part of the harness;

FIG. 4 is a sectional view through the headband taken as indicated at 4—4 of FIG. 2;

FIG. 5 is a perspective view with parts in section of the sweatband which is applied to the headband of the harness;

FIG. 6 is a sectional view through the headband and sweatband as indicated at 6—6 of FIG. 1;

FIG. 7 is a sectional view showing the connection between the harness and the hat as indicated in the plane at 7—7 of FIG. 1;

FIG. 8 is a perspective view with parts in section of the hat showing the opening in the wall of the hat to receive a part of the harness;

FIG. 9 is a perspective showing of a locking button on the headband;

FIG. 10 is a perspective showing of a portion of the headband; and

FIG. 11 is a plan view showing the connection means between the four harness members at the top of the harness.

Referring to the drawings, the hat 6 is preferably formed of resin-bonded fiber glass, although it may be made of metal or fiber. The hat 6 is provided with a series of spaced apertures near the juncture between the hat brim and crown. The apertures 7 are shaped as best shown in FIG. 8 to receive a corresponding series of interlocking lugs such as 9 and 10 carried by the harness. The harness in its entirety is illustrated in FIG. 2 and comprises a headband indicated in its entirety as at 11. The headband element 11 includes four spaced upwardly extending fingers 12, 13, 14 and 15 (FIG. 3). The finger 12 is located adjacent the headband portion 16 which is provided with a slot 17 and a locking button 18. The upwardly extending finger 15 is located adjacent the other end of the headband which is provided with a series of openings 20 and a T-shaped lug 21 as best shown in FIG. 10. When the headband end portions are overlapped as shown in FIG. 2, the lug 21 is fitted within the slot 17 somewhat in the fashion of a button being passed through a buttonhole. The lug 21 permits sliding movement of the end sections of the headband relative to each other so as to vary the head size and, when the proper head size has been selected, the button

3

18 is pressed into one of the openings 20 and the headband is then retained in proper head size.

Each of the upwardly extending fingers 12 to 15 is adapted to have connected thereto an inverted V-shaped member. The V-shaped member 24 is assembled on the upwardly extending finger 15 by threading the finger 15 over the lower bar 25 and under the middle bar 26 and thence upwardly where an opening at the apex of the member 24 is pressed over the pin or button 27. The button 27 may be integrally formed on the member 15, as shown in FIG. 3, or the button 27 may consist of a separate plastic headed fastener which is apertured transversely as at 28 to receive a drawstring 29.

The harness is preferably molded of polyethylene plastic, although vinyl polymer material and other semi-rigid plastic material may be employed.

The V-shaped member 34, which is mounted on the finger 14, is similar to the V-shaped member 24 except that the opening between the bar 35 and the middle bar 36 is narrower than the opening which receives the finger in the V-shaped member 24. The lower end portions of the member 24 extend outside of the headband 11 and are provided with integrally molded lugs 38 and 39. Each of the lugs 38 and 39 has a width corresponding substantially to the width of the spaced opening 7 in the hat so that the lugs 38 and 39 may be pressed through such opening 7 from the inside of the hat. Each of the lugs 38 and 39 has spaced parallel recesses 38a and 39a to provide a minimum lug dimension between the recesses, which minimum width portion enters the reduced width portion 7a of the opening 7 in the hat.

The upwardly extending finger 13 of the headband is provided with a similar inverted V-shaped member 44 which is constructed and arranged substantially as the V-shaped member 34. The opening between the lower bar 45 and the middle bar 46 of the member 44 is like the opening in member 34 so that the finger 13 extending upwardly therethrough is restrained against lateral shifting. The members 24 and 54 may shift within limits relative to the members 15 and 12 as limited by the wide slotted openings in the members 24 and 54, respectively.

The finger 12 carried by the headband is provided with an inverted V-shaped member 54. The member 54 is in phantom outline in the illustration in FIG. 2 to permit a clear showing of the member 44. The member 54 is provided with an opening between the lower cross-bar and the middle cross-bar substantially as shown in connection with the V-shaped member 24. The width of the openings in V-shaped members 24 and 54 allows the fingers 12 and 15 to be repositioned as the headband is adjusted to different sizes. Each of the inverted V-shaped members is provided with lugs such as the lugs 9-10-38-39 to enter the openings 7 of the hat.

It will be understood that members 24 and 54 are at the rear of the hat and that members 34 and 44 are at the front of the hat. This provides for more flexibility at the rear of the hat and adds to the comfort and safety of the wearer.

The upper ends of the V-shaped members 24, 34, 44 and 54 are each apertured and connected to their respective fingers by a button 27, as shown in FIG. 11. The button 27 is provided with a transverse bore 28 to receive the drawstring 29.

The members 24, 34, 44 and 54 and their respective fingers 15, 14, 13 and 12 are also connected by cross-members 60 and 61. The members 60 and 61 are apertured at each end to receive the buttons 27. The members 60 and 61 along with the drawstring 29 permit an accurate and comfortable adjustment of the head harness as to height, whereas the headband 11 provides for comfortable adjustment of the headband circumferentially about the wearer's head. It will be observed that fingers 13 and 15 connected by 61 form a sort of transverse saddle over the head of the wearer. The fingers 12 and 14 along with 60 form a similar saddle. This double

4

saddle arrangement is independent of the drawstring 29. The harness height is easily adjusted by tying the drawstring 29 either tightly or loosely as required to fit the wearer. When the drawstring is tightened, the buttons 27 are drawn more closely together to decrease the harness height, and the cross-members 60 and 61, being flexible, bow upwards as the distance between the opposed sets of fingers decreases. In this case, the cross-members 60 and 61 serve to limit the distortion of the quadrilateral formed by drawstring 29, and further serve to insure the connection between the opposed fingers in case the drawstring should break or become untied.

The headband of the harness is provided with a sweatband 70 illustrated in its entirety in FIG. 5. The headband 11 has an integrally molded T-shaped channel 11a formed along the lower edge of the headband. The channel 11a provides a re-entrant T-shaped opening and the sweatband 70 is provided with a T-shaped rib 71 which is received by and frictionally held within the channel 11a. A flange 72 on the rib member 71 is stitched to the leather sweatband 70 as at 73.

It will be understood that the channel 11a is open at each end of the headband 11 so that the T-shaped rib 71 may be inserted through the open end and pulled along until the sweatband completely encircles the headband. When finally assembled the sweatband 70 is turned upwardly within the headband as shown in FIG. 6.

Although in the embodiment illustrated of my invention the members 24 and 54 give greater flexibility at the rear of the hat relative to the harness than is provided by the members 34 and 44, it will be understood that all of the V-shaped members may be given greater flexibility relative to the hat by enlarging the slot which receives the headband finger. It will also be understood that the flexibility of the hat relative to the harness may be reduced by reducing the length of the slot at the lower portion of the V-shaped members.

The sweatband 70 may be replaced quickly and easily without removing the harness from the hat; the headband 11 may be adjusted to suit the wearer without removing the harness from the hat, and the vertical height of the harness may be varied by means of the drawstring 29 without removing the harness from the hat. The connection between the lower portion of the harness members 24, 34, 44 and 54 and the hat is in the area between the headband and the hat. The members, such as 38 and 39, are integrally formed with the flat material of the V-shaped member so that impact of loads applied to the hat are transmitted through the relatively wide, flat sections of the inverted V-shaped members and thence to the headband itself. Vertical loads at the top of the hat are applied to the V-shaped members through the medium of the lugs, such as 38 and 39, so that the V-shaped members are placed in tension and the pull imparted thereto is distributed by the members 60 and 61 and the drawstring 29 to the other portions of the harness. Preferably the lower portion of opposed harness members such as 44 include a slot 4 to receive a chin strap (not shown) for holding the hat on the wearer's head.

It will be observed from FIGS. 2, 3 and 4 that the sweatband channel 11a terminates at 11b so as to provide a smooth overlap of the headband 11. The free end of the sweatband 70 is provided with an aperture 18a which is impaled on the fastening button 18 when the headband is in overlapped adjusted position.

Although I have shown and described one form of my harness in considerable detail, it will be appreciated by those skilled in the art that numerous variations may be made therein without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. A harness adapted to be detachably secured to a relatively rigid hat, said harness being formed of flexible

5

material and comprising a headband and a plurality of spaced upwardly extending fingers, a plurality of members formed of flexible material and of generally inverted V form, a plurality of vertically spaced slots being formed in each member for threading engagement with one of said fingers, means for detachably securing the upper ends of said fingers to the members by a drawstring, means for detachably securing the lower portions of said members to a hat, means for adjusting the headband to different head sizes without detachment from the members, slots in certain of said members being of a size to permit limited movement of the fingers during adjustment of the headband, and slots in other of said members being of a size to substantially restrain movement of the fingers.

2. In combination a safety hat having a series of spaced apertures adjacent the brim of that hat, a harness comprising a headband, a plurality of integrally formed upwardly extending fingers carried by said headband, inverted V-shaped members secured at the apex thereof to the upper ends of each of said fingers, said V-shaped members having an opening therein at the lower portion thereof to receive said fingers adjacent the headband, said V-shaped members having the lowermost portions thereof outside of the headband and inside of the hat, said last-named portions having integrally formed lugs adapted to be secured in the said apertures of said hat.

3. In combination a safety hat having a series of spaced apertures adjacent the lower crown portion of the hat, a harness comprising a headband, a plurality of integrally formed upwardly extending fingers carried by said headband, inverted V-shaped members secured to the upper ends of each of said fingers, said V-shaped members having an opening therein to receive the intermediate portion of said fingers, said V-shaped members having portions outside of the headband and inside of the hat, said last-named portions having integrally formed lugs adapted to be secured in the said apertures of said hat, and means to secure said fingers and V-shaped members to each other at the upper ends thereof.

4. A harness comprising a headband formed of a flat strip of polyethylene plastic material, one end of said headband strip having a slot therein, the other end of said headband having an integrally formed lug adapted to extend into said slot, said headband adjacent said lug having a series of apertures, said headband adjacent said slot having an integrally formed button adapted to enter one of said apertures to lock the headband closed in adjusted position, said headband having four spaced upwardly extending integrally formed fingers arranged to curve inwardly towards the top of the hat, each of said fingers having an inverted depending V-shaped member secured thereto, the vertical height of said V-shaped members exceeding the length of said fingers so that the lower portions of the V-shaped members overhang said headband, means to adjustably connect the upper ends of said fingers and said V-shaped members to each other, said lower portions of said V-shaped members having integrally formed outwardly extending lugs for securing said harness to a hat.

5. A harness comprising a headband formed of flat polyethylene plastic material, one end of said headband having a slot therein, the other end of said headband having an integrally formed lug extending into said slot, said lug having a flat head overhanging said slot, said headband adjacent said lug having a series of apertures, said headband adjacent said slot having an integrally

6

formed button adapted to enter one of said apertures to lock the headband closed in adjusted position, said headband having a plurality of spaced upwardly extending integrally formed fingers arranged to curve inwardly towards the top of the hat, each of said fingers having an inverted depending V-shaped member secured thereto, the vertical height of said V-shaped members exceeding the length of said fingers so that the lower portions of the V-shaped members overhang said headband, the width of said members at their lower portions exceeding the width of the fingers, means to adjustably connect the upper ends of said fingers and said V-shaped members to each other, said lower portions of said V-shaped members having integrally formed sections at each side of its supporting finger, said sections having outwardly extending lugs for securing said harness to a hat.

6. Safety head gear comprising the combination of a relatively rigid hat and a harness detachably secured to the hat adapted to support the hat in spaced relation to the head of a wearer, said harness comprising a head engaging portion including an adjustable headband and a plurality of integral upwardly extending fingers formed of flexible material, a plurality of members formed of flexible material detachably secured to the upper ends of said fingers by a drawstring, means for detachably securing the lower portion of said members to the hat, and means slidably interconnecting said members and said fingers adjacent said headband to limit radial movement therebetween.

7. Safety head gear comprising the combination of a relatively rigid hat and a harness detachably secured to the hat adapted to support the hat in spaced relation to the head of a wearer, said harness comprising a head engaging portion including an adjustable headband and a plurality of integral upwardly extending fingers formed of flexible material, a plurality of members formed of flexible material detachably secured to the upper ends of said fingers by a drawstring, said drawstring forming a straight-sided figure between the upper ends of said fingers, flexible strip means for limiting the distortion of the straight-sided figure formed by said drawstring, and means for detachably securing the lower portion of said members to the hat.

8. Safety head gear comprising the combination of a relatively rigid hat and a harness detachably secured to the hat adapted to support the hat in spaced relation to the head of a wearer, said harness comprising a head engaging portion including an adjustable headband, a plurality of fingers formed of flexible material extending upwardly from said headband and integral therewith, said fingers being spaced about said headband as diametrically opposed pairs, a member formed of flexible material detachably secured to the upper end of each of said fingers, a drawstring interconnecting the upper ends of said fingers and said members, means slidably interconnecting said members and said fingers adjacent said headband to limit radial movement therebetween, and means for detachably securing the lower portion of each of said members to the hat.

References Cited in the file of this patent

UNITED STATES PATENTS

2,340,980	Ostolaza et al. _____	Feb. 8, 1944
2,710,965	Bowers _____	June 21, 1955

FOREIGN PATENTS

790,809	Great Britain _____	Feb. 19, 1958
---------	---------------------	---------------