Dec. 7, 1965 E. J. JOFFE 3,221,340

HARNESS IN COMBINATION WITH A RIGID HAT

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Fig. 1.

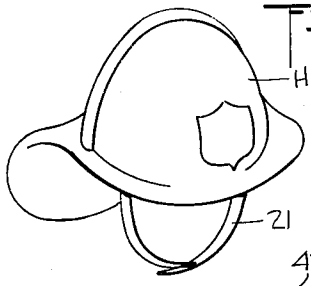
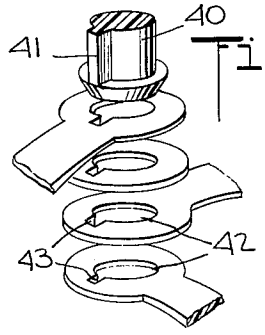


Fig. 5.



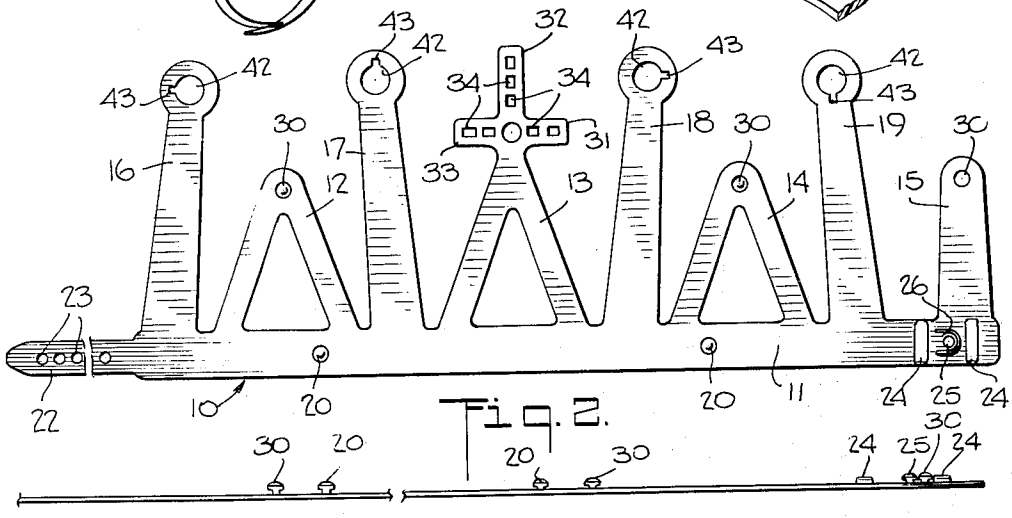


Fig. 2.

Fig. 3.

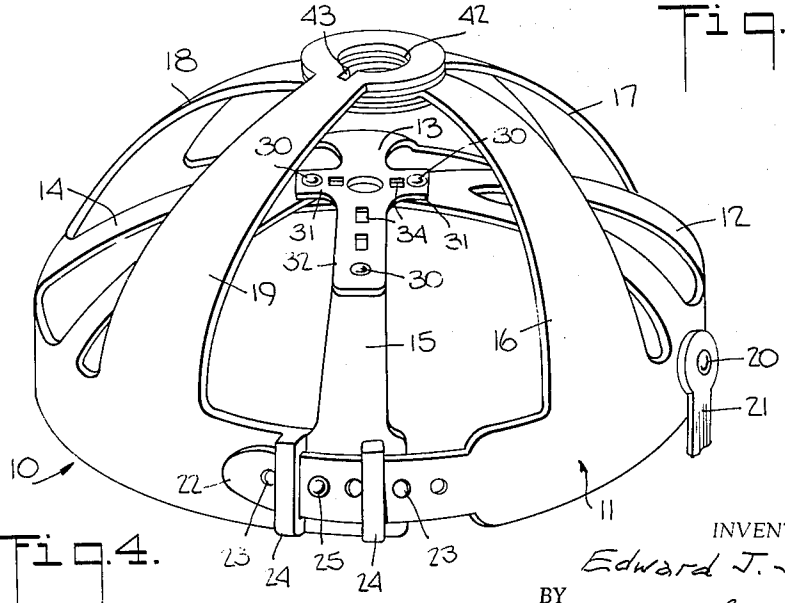


Fig. 4.

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Fig. 6.

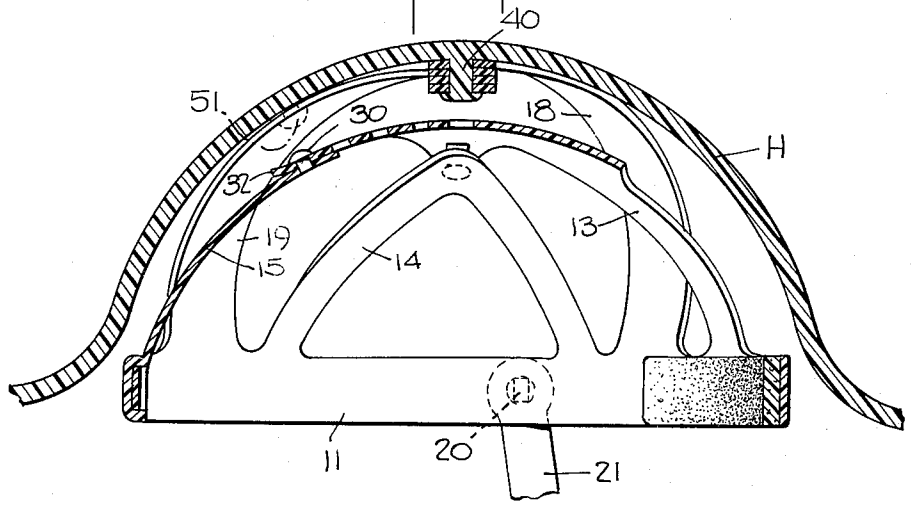
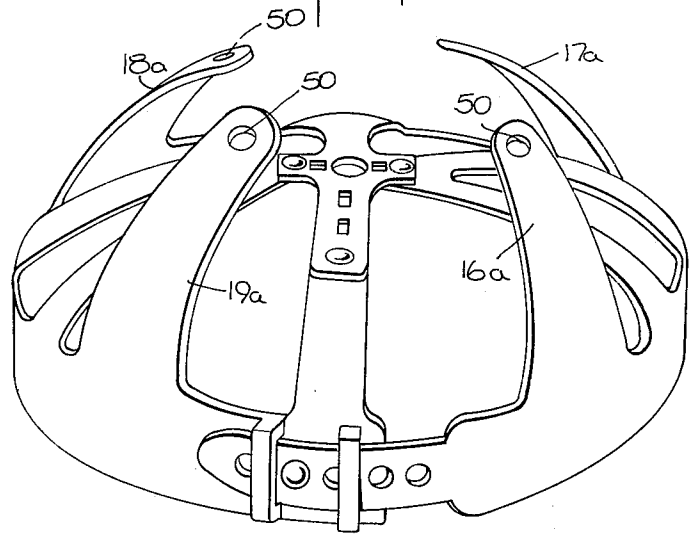


Fig. 7.



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HARNESS IN COMBINATION WITH A RIGID HAT

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5 Claims. (Cl. 2—3)

This invention relates to a harness of the type utilized for supporting a hard hat or helmet, the harness being applied to the head of the wearer and holding the hard hat or helmet in spaced relationship to the head for protecting the head.

Those skilled in the art will well appreciate that many types of harness have been contributed to the art. As a matter of fact, there are numerous patents showing various types of harness, but so far as I have been able to ascertain, no really effective harness has as yet been developed. Thus, I believe that my invention herein set forth, is the first to contribute a one-piece harness manufactured from plastic material and easily applied to a helmet for supporting that helmet in effective spaced relation to the head to which the harness is applied.

As a particular feature of my invention, the one-piece plastic harness is readily adjustable to the head size and is secured to the helmet by means that hold the helmet at all times in spaced relationship to the head, while at the same time yieldingly resisting the movement of the helmet toward the head.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

Referring now to the drawings, FIG. 1 shows in perspective a helmet of the type to which my harness may be applied.

FIG. 2 shows the harness of my invention laid flat and showing its one-piece construction.

FIG. 3 is an elevation of the harness illustrating the integral buttons and loops through which it is assembled.

FIG. 4 is an isometric view showing the harness in assembled position, but without illustrating the helmet in its relation to the harness.

FIG. 5 is an exploded view and shows the manner in which portions of the harness are secured to the helmet.

FIG. 6 is a section through the helmet and harness showing the relation of the harness to the helmet, as well as the manner in which the helmet is held in spaced relation to the head.

FIG. 7 is a view similar to FIG. 3, showing a modified form of the invention.

Referring now more particularly to the drawings, reference letter H indicates a helmet such as may be worn by a fireman. As a matter of interest, the present harness is to be used with a plastic fireman's hat. The harness is indicated by reference numeral **10**, and is formed of one piece of flexing plastic material such as polyethylene. This material is selected for strength as well as flexing, and for ease of manufacture.

The one piece **10** of plastic material forming the harness has a head band portion designated by reference numeral **11**, a series of four head straps **12**, **13**, **14** and **15**, and four support bands **16**, **17**, **18** and **19**.

The head band **11** has a pair of upstanding buttons **20** that are utilized for the purpose of securing to the harness a chin strap, designated by reference numeral **21**, should such a chin strap be found desirable.

In utilizing the harness, the head band is brought together as illustrated in FIG. 4. Thus, a strap portion **22** of the head band **11** has a series of holes **23**, while the opposite end of the head band has a pair of loops **24**, together with a button **25** that is molded so as to be upstanding from a cutaway tab **26**. The strap **22** is brought under both loops **24**, while one of its holes **23** is brought over the button **25**, so that the button **25** snaps into one of the series of holes **23**. Obviously the head band **11** is now in proper adjustment to the particular size of head to which the harness is to be applied.

Three of the head straps **12**, **14** and **15** are formed with an integral button **30** that is molded upstanding therefrom. One head strap **13** is formed with three legs **31**, **32** and **33**, each having two or more holes **34**. As is well illustrated in FIG. 4 the buttons **30** of three straps may be applied in particular openings **34** of the legs **31**, **32** and **33** of the fourth strap **15**, whereby to complete the formation of a head support. Thus, the head straps **12**, **13**, **14** and **15** together with the head band **11** have been adjusted in FIG. 4 to fit effectively the head of the wearer. Obviously, it is possible to use as many openings **34** in the legs **31**, **32** and **33** as may be required to give effective adjustment. It is also possible to space the openings **34**, as well as the openings **23** in the strap **22**, to give that effective adjustment that may be required.

As shown in FIG. 6 the helmet H is formed with an integral button **40**, shown in isometric in FIG. 5. The button **40** has a rib **41** with which coact slots **43** of a series of holes **42**, formed in the upper end of each of the support bands **16**, **17**, **18** and **19**. As is shown in the exploded and isometric view of FIG. 5, each of the four head straps is brought opposite the button **40** and then slipped onto the button **40** to the position illustrated in FIG. 6. Once this is accomplished, the slots **43** coact with the rib **41** to prevent rotation of the harness relatively to the helmet. Therefore, the harness is not only held assembled to the helmet by the very simple means shown, but is also prevented from rotation relatively to the helmet, so that a desired assembled relationship between the helmet and harness is maintained.

When the support bands are assembled to the helmet, the upper ends of the bands are flexed, with certain of the bands flexing more than others. Flexed lengths of each band will therefore lie against the inner surface of the helmet as shown in FIG. 6. Because the support bands **16**, **17**, **18** and **19** are considerably longer than the head straps **12**, **13**, **14** and **15** it is obvious that the flexed lengths of the four support bands will function very effectively to hold the helmet away from the head of the wearer. In order to bring the helmet against the head of the wearer, a rather considerable distortion of the entire harness must be brought about. This distortion is resisted by the polyethylene material, and through control of this material, this resistance may be increased or decreased.

It is also well to note that the head band is well displaced from the helmet, and that here again, a very considerable flexing and distortion of the support bands **16**, **17**, **18** and **19** must be effected before the helmet can be brought against the head band and the head of the wearer.

In FIG. 7 I show a modified form of the invention in which the support bands are designated by reference nu-

merals **16***a*, **17***a*, **18***a* and **19***a* to distinguish them from the head bands **16**, **17**, **18** and **19** of the preferred form of my invention. The several support bands **16***a*–**19***a* are shorter than the bands **16**–**19**, and each is equipped with an opening **50** through which it may be slipped over a button molded on the helmet H, this button being similar to the button **40**, but shorter. I have illustrated in FIG. 6 in dotted lines a button **51** which might be formed on the helmet H for cooperation with the holes **50** of the straps **16***a*–**19***a*. As in the first modification, considerable distortion of the harness would be necessary in order to bring the helmet against the head of the wearer. Further, as in the first modification, the application of the helmet to a length of each of the straps **16***a*–**19***a*, effectively maintains the helmet spaced from the head of the wearer while yieldingly resisting approach of the helmet to the head of the wearer.

I believe that the very considerable contribution of my invention will now be apparent to those skilled in the art.

I claim:

1. In combination with a rigid hat, a one piece plastic harness comprising a head band, a series of head straps formed each integral at one end with said head band, a series of support bands each also formed integral at one end with said head band, means securing the opposed ends of said head band to form a band to lie about the head of the wearer, means for securing the ends of the head straps remote from said head band to one another so as to form a head harness to fit on the head of the wearer, button means on the rigid hat, and the ends of said support bands having openings to be applied to said button means for securing the ends of the support bands remote from said head band to the upper portion of the rigid hat with said ends in stacked vertical position on said button means, said openings and said button means being shaped for holding said bands against rotation on said button means, said support bands being flexed when secured to the hat with the rigid hat resting on the flexed linear lengths of each upper end of each support band with the flexed lengths yieldingly holding the hat in a position displaced vertically from said head straps, and said head band and the lower portions of said support bands lying spaced from said hat while supporting said hat through the upper portions of said bands.

2. In combination with a rigid hat, a one-piece harness comprising a head band, a series of head straps each integral at one end with said head band and spaced linearly along said head band, a series of support bands also each integral at one end with said head band and longer than said head straps and also spaced linearly along said head band, means securing the opposed free ends of said head band to form a band to lie about the head of the wearer, means for securing the ends of the head straps remote from said head band to one another so as to flex said straps to form a head harness with said head band to fit the head of the wearer, means for securing the end portions of the support bands remote from said head band to the upper portion of the rigid hat with said support bands flexed so that the rigid hat rests on the flexed upper end portions of said support bands in a position displaced vertically from said head straps and with its lower inner peripheral surface spaced at all points laterally from said head band.

3. In combination with a rigid hat, a one-piece harness comprising a head band, a series of at least three head straps each integral at one end with said head band and spaced linearly therealong, a series of at least three relatively longer support bands also each integral at one end with said head band and spaced linearly therealong in alternating relation to said head straps, means securing the opposed ends of said head band to form a band to lie about the head of the wearer, means for securing the ends of the head straps remote from said head band to one another so as to flex said straps to form a head harness with said head band to fit the head of the wearer, and means for securing the end portions of the support bands remote from said head band to the upper portion of the rigid hat with said support bands flexed so that the rigid hat rests on the flexed upper end portions of said support bands in a position displaced vertically from said head straps and with the inner periphery of the hat spaced from said head band.

4. In combination with a rigid hat, a one-piece flexing cast plastic harness comprising a head band, a series of head straps each formed integral at one end with said head band, a series of support bands each also formed integral at one end with said head band, said head band, head straps and support bands lying all in substantially a single plane when cast, means securing the opposed ends of said head band to one another in flexed position to form a band to lie about the head of the wearer, means for securing the ends of the head straps remote from said head band to one another in flexed position so as to form with said head band a head harness to fit on the head of the wearer, means for securing the end portions of the support bands remote from said head band in a flexed position to the upper portion of the rigid hat with said rigid hat resting on the upper end portions of said support bands flexed by the weight of said hat in a position displaced vertically from said head straps, and said head band together with said head straps and the lower portions of said support bands lying spaced from said hat while supporting said hat through the upper flexed portions of said support bands.

5. In combination with a rigid hat, a one-piece flexing plastic harness comprising a head band, a series of head straps each formed integral at their lower ends with said head band, a series of support bands each also formed integral at their lower ends with said head band, means securing the opposed ends of said head band to one another in flexed position to form a band to lie about the head of the wearer and in spaced relation to the inner peripheral surface of said hat so as to hold said lower ends of said straps and support bands also spaced from the inner peripheral surface of said hat, means for securing the ends of the head straps remote from said head band to one another in flexed position so as to form with said head band a head harness to fit on the head of the wearer, and means for securing the end portions of the support bands remote from said head band in flexed position to one another and to the upper portion of the rigid hat with said rigid hat resting on the upper end portions of said support bands flexed incidental to the weight of the hat in a position displaced vertically from said head straps.

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JORDAN FRANKLIN, *Primary Examiner*.