June 25, 1940. F. M. BOWERS 2,205,741

ADJUSTABLE HEADBAND

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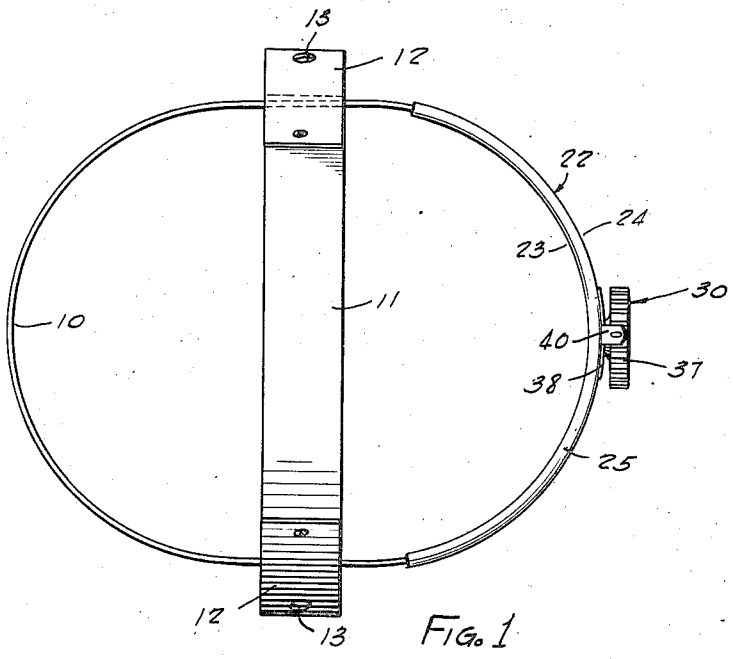

FIG. 1

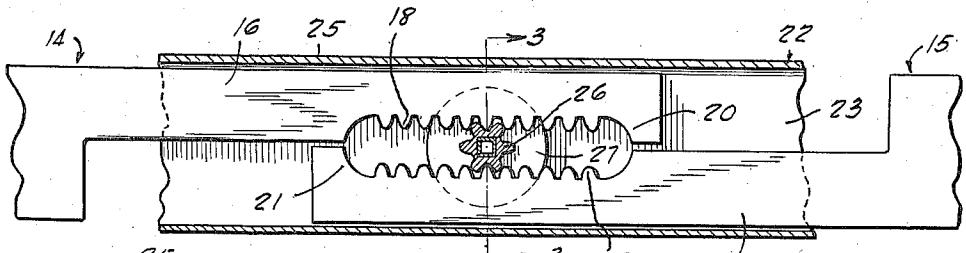

FIG. 2

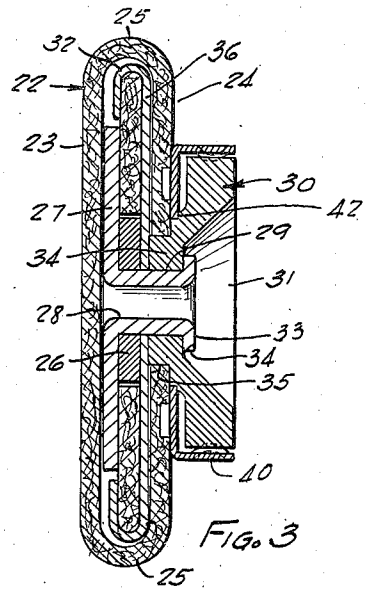

FIG. 3

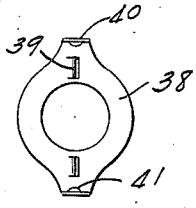

FIG. 4

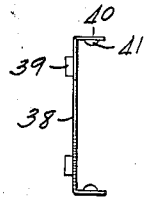

FIG. 5

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ADJUSTABLE HEADBAND

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4 Claims. (Cl. 2—8)

This invention relates to headbands such as are commonly employed in conjunction with welding helmets, shields, and the like, for the purpose of retaining the helmet or protective element in position on the head of the wearer.

It is now common practice in this art to avail of a headband of the character above noted which is adjustable so that the headband may be adjusted to fit the head of any particular wearer. However, the known devices and means for carrying out the adjustment now available present certain undesirable features, particularly as to the difficulty of operating the same for adjustment, and, of necessity, of providing unsightly and undesirable projections and protuberances.

With the foregoing conditions in mind, this invention has in view, as its foremost objective, the provision of an adjustable headband of the character above noted, which includes novel and improved means for adjusting the headband to the size of a particular wearer.

More in detail, this invention has in view an arrangement in which the headband proper comprises a flat strip adapted to fit around the head of a wearer. This strip has a pair of free ends adjacent to one another and by adjusting the relative positions of the free ends, the size of the band may be varied as occasion demands.

In accordance with this invention, the free ends of the strip are cut away to provide complemental extensions which overlap one another, and which are received in a casing defined by a flattened out tubular casing element.

The overlapping edges are formed with gear teeth and a gear element is positioned between the gear teeth on the respective ends and is adapted to be rotated to cause relative movement of the said overlapping portions.

An important feature of the present invention is associated with the provision of means for operating the above noted gear element. The operating member is disposed on the outer side of the casing in a convenient position, and is drivably connected with the gear element to perform the necessary function.

With the above noted arrangement, the headband, in its entirety, presents a sightly appearance, free from objectionable extraneous structure. At the same time the headband may be adjusted with ease and assurance of obtaining the proper degree of adjustment.

Various other more detailed objects and advantages will in part become apparent and in part be hereinafter stated, as the description of the invention proceeds.

The invention, therefore, comprises an adjustable headband which consists of a strip of material defining the headband and which strip has cut away overlapping extremities. The edges of these overlapping portions are formed with gear teeth, and the gear element is operatively associated with the gear teeth. The overlapping portions are enclosed within a casing, and a gear element is operatively mounted on the casing and drivably connected with the gear element for causing rotation thereof.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing, wherein

Figure 1 is a top plan view of an adjustable headband made in accordance with the precepts of this invention,

Figure 2 is an enlarged detailed view taken as a vertical section through the casing which houses the overlapping portions,

Figure 3 is a vertical section taken at right-angles to the showing of Figure 2; this view being taken about on the plane represented by the line 3—3 of Figure 2,

Figure 4 is a detailed elevational view of a detent member, and

Figure 5 is an elevational showing taken at right-angles to the showing of Figure 4.

Referring now to the drawing, wherein like reference characters denote corresponding parts, a headband of the type with which this invention is concerned is shown in Figure 1 as comprising a strip 10 that is adapted to encompass the head of a wearer. As shown in Figure 1 a cross piece referred to as 11 may be connected at each end to the strip 10, and is adapted to fit over the top of the head of a wearer. This cross piece 11 may be formed with a loop structure at each end designated 12, and which loop structure is formed with an opening 13 which constitutes means for pivotally mounting a welding shield or similar protective device to the headband.

The strip 10 has a pair of free ends referred to generally as 14 and 15. Each of the free ends 14 and 15 is cut away to provide complemental overlapping end portions 16 and 17. The edges of the overlapping portions 16 and 17 which are closely adjacent one another are provided with a series of gear teeth defining racks identified as 18 and 19 respectively.

It is notable that the rack 18 is spaced inwardly from the edge of the portion 16, and at the end thereof the end portion 16 is returned to its original dimension to provide a stop identified

at 20. In a similar manner the rack 19 is spaced inwardly from the edge of the end portion 17, and the latter is formed with a stop at 21.

A casing member 22 receives the overlapping portions 16 and 17 of the strip 10, and extends past these overlapping portions a considerable distance, as shown in Figure 1. This casing member 22 preferably takes the form of a flattened out tubular member that is curved to conform to the curvature of the head of a wearer. This casing element is formed with an inner wall 23 and an outer wall 24, which are connected at top and bottom by the curved portions represented at 25.

A gear element 26 is interposed between the racks 18 and 19, and is in effective mesh therewith. This gear element 26 carries a disk member 27 that is interposed between the wall 23 of the casing of the gear element and overlapping portions 16 and 17; the disk 27 being formed as integral with a sleeve 28.

The gear element 26 is drivably mounted on the sleeve 28 that extends through an opening 29 formed in an operating member designated 30. This operating member 30 is formed with a cup-shaped recess 31, and the extremity of the sleeve member 28 is expanded at the bottom of the recess 31 to secure the various parts in assembled relationship; it being notable that the sleeve 28 is formed with a flange 33 that engages the operating member 30 in the depression 31 about the opening 29.

The operating member 30 is formed with an extension 34 that projects into an opening 35 formed in the wall 24 of the casing. A washer 36 that is comparable to the disk 23 is interposed between the extension 34 and wall 24 on one side, and the gear element 26 and overlapping portions 16 and 17 on the other side. This washer 36 is formed with upper and lower overhanging flanges 32 that fit over the outer edges of the end portions 16 and 17 respectively. The bends connecting these flanges 32 with the main body portion of the washer 36 serve to maintain the end portions 16 and 17 in properly spaced relation from the curved portions 25 of the casing 22.

The operating member 30 is cylindrical in formation, and the cylindrical surface thereof is provided with a series of recesses 37 to provide a good grip for rotating this operating member, and also for cooperation with a detent that is shown in Figures 4 and 5. This detent comprises a ring-like body portion 38 having tangs 39 struck therefrom which are embedded in the wall 24. Extending outwardly from the body portion 38 at diametrically opposite points are a pair of ears 40 formed with inwardly projecting protuberances 41 that are yieldably received in the corresponding recesses 37.

It is notable that the operating member 30 is formed with a shoulder 42 that engages the ring 38 to hold the latter in position in engagement with the outer face of the wall 24.

Thus the operating member 30 may be rotated by exerting sufficient force to cause the protuberances 41 of the detent to ride out of the recesses 37. However, the effect of this detent is to maintain the headband in any adjusted position.

The strip 10, cross piece 11 and casing 22 all may be made from any suitable material, but the invention has in view as a preferred embodiment a fibrous material which is suitably adapted to the forming operations necessary to the manufacture, and at the same time will result in a product having the required properties of strength and rigidity. During the manufacturing operations, and before final setting of the fibrous material the tangs 39 are readily embedded in the wall 24 of the casing. Certain fibrous materials now available are particularly adapted to the manufacture of the above described adjustable headband, because by moistening certain parts such as the casing 22 they will be expanded to facilitate assembly. With the moistened and expanded casing 22 assembled about the end portions 16 and 17 and parts associated therewith it is subjected to the action of a mold which shapes it into its final form. This mold may be heated to facilitate drying, which causes shrinkage of the casing 22 to its final size.

It is evident that the operating member 30 and gear element 26 are in a non-rotative driving relationship. Thus by turning the operating member 30 the gear element 26 is rotated to cause relative movement of the overlapping portions 16 and 17 that constitute the free ends of the strip 10. Thus the strip 10 may be adjusted to fit the head of any particular wearer.

While a preferred specific embodiment of the invention is hereinbefore set forth it is to be clearly understood that I am not to be limited to the exact construction illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

I claim:

1. An adjustable headband of the character described comprising a strip adapted to fit about the head of a wearer and having relatively movable overlapping end portions, each of said end portions being provided with a series of teeth defining a rack, a tubular casing having inner and outer walls receiving said relatively movable end portions, the inner wall of said casing being curved to snugly fit about the head of a wearer, a shaft disposed within the casing and carrying an abutment element interposed between the inner wall of said casing and said overlapping end portions, the outer wall of said casing being formed with an opening, an operating member, said shaft and said operating member extending through said opening, a gear element drivably carried by said shaft and in operative engagement with said racks, and means consisting of elements carried by said operating member and outer wall of the casing which cooperate to yieldably maintain the operating member in an adjusted position.

2. A headband comprising a band having ends in overlapping relation, a tubular one piece casing encircling said overlapping ends, said casing being curved to conform to the shape of a wearer's head and presenting flat inner and outer curved walls, a shaft having one end thereof terminating in said casing between said overlapping ends and the inner face of said inner wall and in floating relation to said inner wall, the other end of said shaft extending through an opening in the outer wall of said casing, and means associated with said shaft for holding said ends of said band in a desired relation to each other.

3. A headband comprising a band having ends in overlapping relation, a curved tubular casing encircling said overlapping ends, said casing having inner and outer walls, a shaft having an inner end in floating relation to said inner wall and carrying an enlargement within said casing for anchoring said inner end in said casing, and

means associated with said shaft for holding said ends of said band in a desired relation to each other.

4. A headband comprising a head encompassing strip having ends in overlapping relation, a curved casing encircling said overlapping ends and having spaced inner and outer walls, a member having one end thereof terminating in said casing in floating relation to said inner wall, and resilient means associated with said member for holding said ends of said band in a desired relation to each other.

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