Aug. 15, 1967 F. J. RITTER 3,335,502

HAIR DRYER CAP

Filed June 17, 1963 2 Sheets-Sheet 1

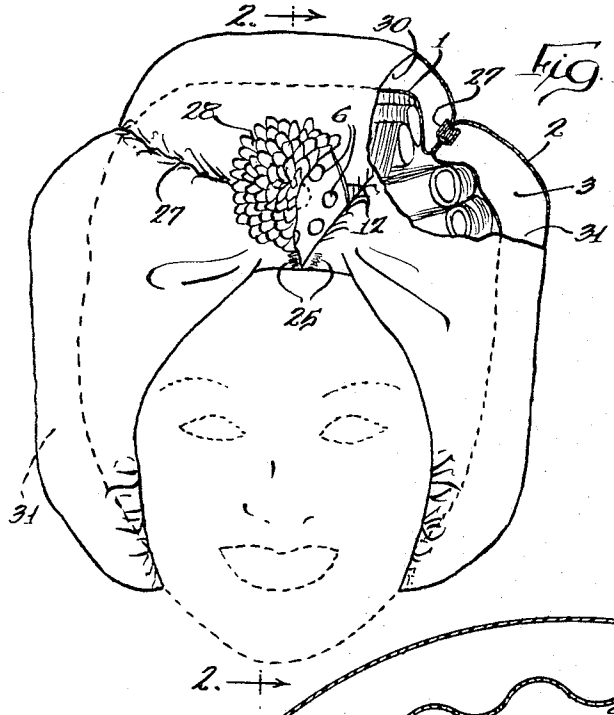



Fig. 1.

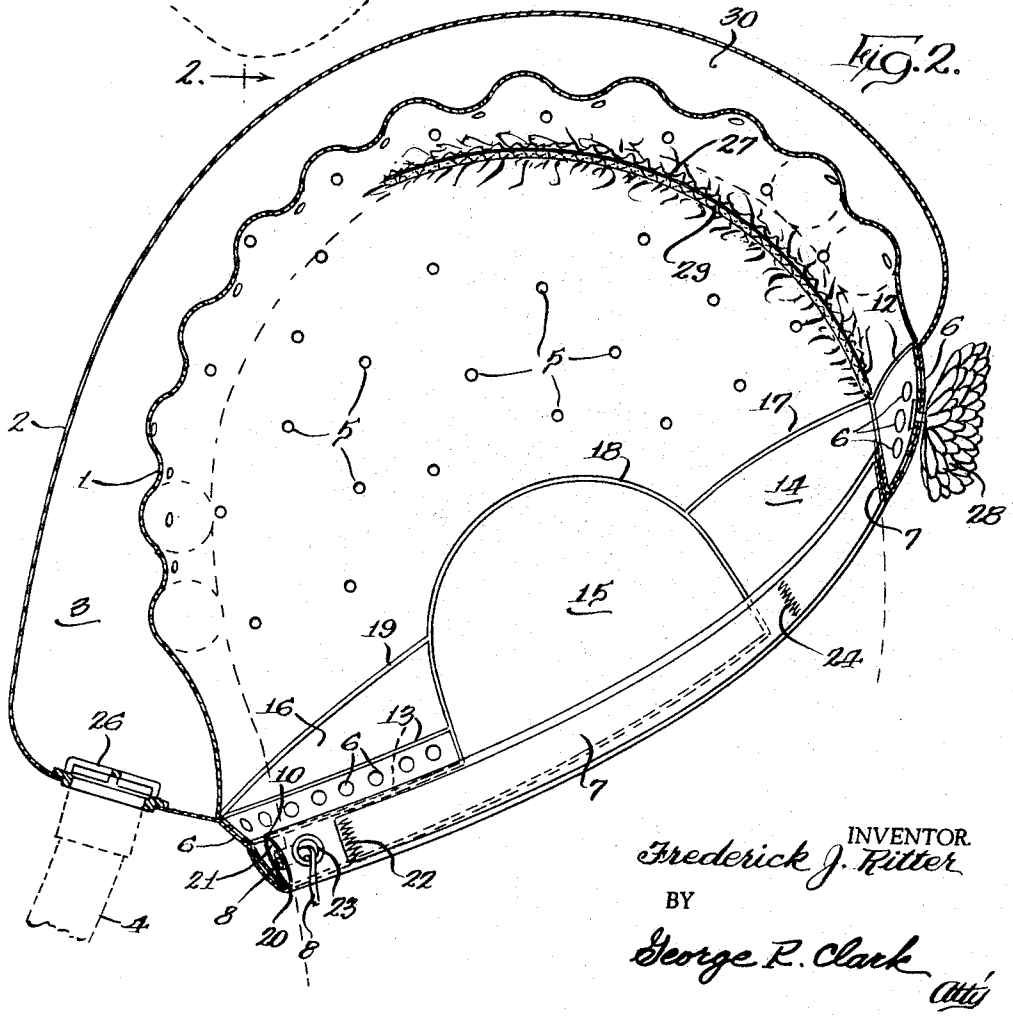



Fig. 2.

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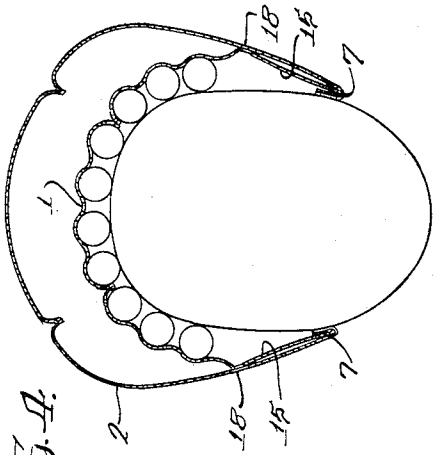


Fig. 4.



Fig. 3.

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3,335,502

# HAIR DRYER CAP

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This invention relates to an improved hair dryer cap, and more particularly, to an improved hair dryer cap useful with nonprofessional type hair dryers.

In the past several years the nonprofessional type hair dryer for home use has become very popular. Typically, this type of hair dryer comprises a relatively small or compact and portable motor, fan and heater unit, a hair dryer cap, and an air hose interconnecting the two.

To a large degree the speed with which the housewife can dry her hair with one of these home units is governed by how efficiently the cap delivers the heated air to the hair. For example, some prior art hair dryer caps merely circulate the heated air over the hair without sufficiently penetrating the hair. This is an inefficient mode of operation. Since the air does not penetrate the hair it does not pick up all the moisture it is capable of removing. This in effect results in wasted heat and prolonged total drying time.

Other prior art hair dryer caps may be somewhat better in penetrating the hair, but this may be at the expense of causing discomfort to the user unless a lower temperature range is selected. For instance, the air may be delivered to the hair in the form of a few strong blasts or jets of air. This gives nonuniform drying of the hair resulting in localized hot spots and discomfort to the user unless the temperature is reduced. Reduction of the air temperature of course prolongs the total drying time.

Prior art hair dryer caps come in a variety of sizes. Some are significantly oversize, but these typically merely circulate the air over the hair. Others are smaller and therefore may do a slightly better job in penetrating the hair. However, these smaller hats are of limited practical value since they are not useful with all kinds of hair styles. For example, they are too small for drying bouffant hair styles or hair settings utilizing large curlers.

Prior art hair dryer hats have other advantages besides those mentioned above. For instance, some allow the heated air to impinge on the user's ears, face or neck. Frequently the heated air plays on the face or neck because of failure to provide an effective air seal between the bottom of the cap and the hairline. Other times, this seal is effective but uncomfortable bands or the like may be required.

Impingement of the air on the user's ears of course can be readily avoided by either using covers for the ears or by not placing air holes near the ears in the case of a cap utilizing a two layer construction to define an air manifold with air holes in the inner layer for admitting air to the hair. Distinct covers for the ears are undesirable since they constitute a separate part which may be misplaced or considered a nuisance by the user. With regard to the expedient of not putting air holes in the portion of the inner layer near the ears, frequently this does not solve the problem of discomfort. This is because this portion may still be part of the inflated manifold. When this is so, then this portion of the inner layer can be quite hot and uncomfortable when it contacts the ears even through it has no air holes for air flow.

Accordingly, it is an object of this invention to provide an improved hair dryer cap which will overcome the disadvantages mentioned above with a minimum of complications and at low cost.



Broadly, in the preferred form of the invention a hair dryer cap is provided which is significantly oversize with respect to a human head so that it can be used with all types or sizes of hair settings or styles. The cap comprises two sheets of flexible plastic material to define an air manifold. The inner layer is essentially unconnected with respect to the outer layer, except for example, along those portions of the cap, as along the bottom edge thereof, which is necessary to define the manifold. Since the inner layer is essentially unconnected to the outer layer, the two layers are slack with respect to each other. This means that when drying air is admitted into the manifold it is inflated. This causes the inner layer to conform closely to the hair on the cap user's head even in the case of compact hair settings or stylings. Manifold-to-hair air distributing holes are formed in the inner layer to cause the air leaving the manifold to penetrate the hair. This is in part due to the fact that the inner layer snugs the hair. Also, however, the exhaust openings for the air directed into the cap are prevented from having direct communication with the air distributing holes. That is to say, the air holes are placed in the inner layer only along portions thereof contiguous to hair. This means that hair is always interposed between the air holes and exhaust openings. Accordingly, and also since the inner layer snugs the hair, the drying air must always penetrate the hair before it can reach the exhaust openings. Additionally, the air holes are distributed throughout the inner layer so as to give uniform drying. This is accomplished by using many small air holes and distributing them so that the size of the openings provided by the air holes relative to unit area of the inner layer is greater near head portions having high hair resistance to air flow than head portions having low hair resistance to air flow.

A large number of small air holes in the inner layer insures no jet effect if some of them should become blocked off because there are always many others. Providing less air hole openings per unit area of the inner layer adjacent to head portions having low hair resistance to air flow than adjacent to head portions having high hair resistance to air flow insures that the air is uniformly distributed to the hair. For example, if the air hole openings per unit area of inner layer were not smaller near head portions having low hair resistance to air flow the air would have a tendency to short circuit head portions having high hair resistance to air flow. This would result in nonuniform distribution of the air to the hair and nonuniform temperature drying or localized hot spots.

Further, in the invention, the portions of the cap which are adjacent to bare skin, such as the ears, are not provided with air holes. These portions are additionally sealed off from the manifold and spaced from the head or at least spaced from the head. This has several advantages. The heated air does not play directly on hairless portions and the air does not have an easy path of exit to the exhaust openings by short circuiting the hair. Additionally, since these portions are not inflated or spaced from the head they cannot cause discomfort.

With regard to the problem of providing an effective but comfortable seal between the cap and hairline, in the preferred form of the invention an elastic band is provided for the bottom edge of the cap. The band is stretched with respect to the bottom edge to ruffle the same. Also, it is attached to the outer surface of the bottom edge. However, the bottom edge is then folded inside the cap to position the band inside the cap. Thus, the band is interposed between the ruffled bottom edge and the user's head and the band is provided with a soft surface to comfortably engage the head. Folding the bottom edge inside the cap has

the advantage of obscuring the bottom edge so as to improve the appearance of the cap. Drawstring means are also provided on the bottom edge of the cap and here also the bottom edge is folded inside the cap to position the drawstring means inside the cap.

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and operation, together with further objects and advantages thereof, may be best understood by reference to the following description taken in connection wtih the acompanying drawings, in which:

FIG. 1 is a partly broken away front elevational view of a hair dryer cap embodying the invention;

FIG. 2 is an enlarged sectional view taken along the section line 2—2 of FIG. 1;

FIG. 3 is an enlarged top view of the cap when layed out flat during one stage of its manufacture; and

FIG. 4 is an illustration of another embodiment of the invention.

Referring now first to FIGS. 1 and 2 of the drawings, illustrated therein is a hair dryer cap or bonnet comprising inner and outer layers **1** and **2** respectively. These two layers define an air manifold **3**. Air is admitted into the manifold **3** by an air hose **4** connected to the rear bottom portion of the hat. The inner layer **1** has a plurality of small manifold-to-hair air distributing holes or apertures **5** formed therein. Also formed in the bottom edge of the cap in both layers are aligned exhaust openings **6**. The openings **6** are located at the forehead portion of the cap and also along the rear portion thereof. As will be more clear hereinafter the air coming into manifold **3** from air hose **4** is distributed by the openings **5** in inner layer **1** to the hair. The air entering the interior of the hat penetrates the hair on the cap user's head and then is exhausted to the atmosphere by way of exhaust openings **6**. The cap is snugly retained on the user's head below the hairline thereof by virtue of an elastic band **7** and drawstrings **8** which will be described hereinafter in greater detail.

Referring now also to FIG. 3, the cap is illustrated in FIG. 3 in laid out flat position during one stage of its manufacture prior to the formation of the same into a head covering shape. In FIG. 3 the cap has been laid out flat so that its inner layer **1** is uppermost. The two layers **1** and **2** are generally identical or coextensive with each other although this need not necessarily be the case. Also, the two layers are constructed from plastic sheet material. However, they could comprise a woven fabric or the like which is flexible with the outer layer **2** being impermeable and the inner layer **1** being permeable to air. The two flexible plastic sheets **1** and **2** are sealed to each other along their corresponding peripheral edges to define the manifold **3** therebetween. The two layers are preferably sealed to each other by a heat formed seam **10** extending along the bottom of the cap and a double heat formed seam **11** formed along the remaining edges of the two sheets. The aligned exhaust opening **6** formed at the forehead portion of the cap are sealed off from the manifold by a heat formed seam **12** connecting the two layers **1** and **2** together. The exhaust openings **6** at the rear of the hat are isolated from the manifold by a pair of seams **13** formed on opposite sides of the row of openings **6**.

It will be noted that the areas **14**, **15** and **16** of the inner layer **1** which will be positioned adjacent to bare skin or hairless portions of the head are devoid of air holes **5**. This is so that the heated air will not be directed against bare skin portions but only against portions of the head which have hair growth. The areas **15** are positioned along the ears when the cap is positioned on a human head, the areas **14** are positioned adjacent the forehead, and the areas **16** are positioned along the back of the neck. These three areas are also sealed off from the manifold **3** by heat formed seam connections between the two layers. These seams are designated by reference numerals **17**, **18** and **19** for the areas **14**, **15** and **16** respectively. Since these areas of the hat are not inflated with heated air they will not become heated and cause discomfort to the hair dryer cap user if in touch with bare skin. However, as will be described more fully hereinafter, actually the seams **17–19** cooperate with the inflatable manifold **3** to space the areas **14–16** and the portions of layer **1** immediately above areas **14–16** away from the head.



A seam **20** is also provided between layers **1** and **2** beneath the aligned row of exhaust openings **6**. This seam **20** and seam **10** define a drawstring channel **21** (see FIG. 2) for the drawstrings **8**. The drawstrings extend into the channel **21** through opposite ends thereof and the opposite ends of the drawstrings **8** are then connected to the other opposite ends of the channel **21** by stitching or the like **22**. Formed in the outer layer **2** are openings **23** through which the free ends of the drawstrings **8** extend.

The elastic band **7** extends continuously between the stitching **22** along the bottom edge of the cap at the sides and the front thereof. The elastic band **7** is connected to the cap by not shown stitching or the like. Along the sides of the cap the elastic band **7** is stretched prior to stitching to the cap so as to gather or ruffle the bottom edge. On each side of the cap the band **7** is stretched in that area positioned between the stitching **22** and another stitching **24** located adjacent to the areas **14**. The remaining or forehead portion of the elastic band **7** is not stretched prior to connection to the cap and can be fastened to the cap by stitchings **25** located at the front of the cap on opposite sides of the front exhaust openings **6** (see FIG. 1). At these stitchings **25** as well as the stitchings **22**, the bottom edge of the cap is turned or folded inside the cap. That is, stitchings **22** and **25** retain the elastic band **7** and the drawstring channel **21** turned inside the cap. This improves the appearance of the bottom edge of the cap. Additionally, the inner facing surface of the elastic band **7** is provided with a soft surface such as an integral fuzzy or felt like soft surface to comfortably engage the cap user's head. Pulling on the drawstrings **8** in opposite directions will tighten the bottom edge of the cap to below the hairline of the cap user so that drying air inside the cap will not escape therefrom and be directed downwardly against the face or neck of the cap user.

A connector **26** is provided in the outer layer **2** adjacent the rear exhaust openings **6** for purposes of detachably connecting the hose **4** to the cap. The air holes **5** have a special distribution. That is to say, there are a great number of them, they are relatively small, and they are distributed throughout the inner layer **1** solely along portions thereof which will be positioned opposite to areas of hair growth. Additionally, the air holes **5** are denser in those portions of the cap which will be positioned adjacent to areas of higher resistance to air flow than to areas of lower resistance to air flow. The same is true with respect to areas more remote from the exhaust openings **6** as compared to areas closer thereto.

The inner and outer layers are significantly oversize with respect to a human head. However, these two layers are essentially unconnected with respect to each other. This means that they are slack with respect to each other. Accordingly, when the manifold **3** is pressurized with incoming heated air the two layers **1** and **2** will billow away from each other. This causes the inner layer to collapse or be biased against the head. Therefore, the inner layer **1** will conform closely or snugly to the hair, regardless of the size or type of the hair styling or the hair curlers utilized for setting the hair. This is illustrated in FIGS. 1 and 2. Since the inner layer **1** conforms closely to the hair, and inasmuch as the air holes **5** are positioned solely along areas of hair growth, the air must first travel through the hair before it can reach the exhaust opening **6**. With the layer **1** snugly conforming to the hair the air discharged through the holes **5** is caused to penetrate the hair and travel therethrough prior to reaching the exhaust openings **6**. If the openings provided by the holes **5** were not larger per unit area of

inner layer 1 adjacent to areas of high hair resistance to air flow than areas of low resistance to air flow, the air would be short circuited around the areas of thick or heavy bunches of hair inasmuch as the air would seek the path of least resistance to flow. This is an additional reason for omitting air holes from those portions of the inner layer 1 along bare skin portions and also for making the openings provided by holes 5 per unit area of inner layer 1 greater in those portions of the cap more remote from the exhaust openings 6. In this manner, the air is uniformly distributed to the hair while simultaneously accounting for differences in density of hair on different portions of the head. Accordingly, the rate of drying for all portions of the head is uniform and in this manner localized hot spots are avoided. That is to say, one part of the hair will not be dried while another is still wet. Instead, all portions of the hair approach the same degree of dryness together until the hair is completely dry. This means that the temperature of the air does not have to be reduced in order to avoid localized hot spots. This being so, the invention makes it possible to utilize a heater in the not shown portable motor, fan and heater unit which has a higher wattage rating than heretofore utilized. Thus, besides providing a higher efficiency over prior art hair dryer caps the invention also makes it possible to increase the rating thereof. These two aspects of the invention make it possible to significantly reduce the hair drying time over that obtainable with prior art hair dryer caps.

The pairs of double seams 11 on opposite sides of the hat are connected together and provide two seams indicated generally by reference numeral 27 in FIG. 1. These two seams 27 meet at the forehead portion of the cap and then extend rearwardly to the crown of the cap in diverging relationship with respect to each other. The air holes 6 at the front of the cap are positioned within the apex or angle between seams 27. The decorative appearance of the cap can be enhanced by connecting an artificial flower 28 or the like at the front of the cap. The flower 28 can in effect obscure the front exhaust openings 6 from view without effecting the exhaust of air therethrough. In the invention it is desired to gather the material along the two seams 27 so as to ruffle the same to enhance the turban-like appearance of the hat. This is accomplished by stitching a stretched elastic band 29 (see FIG. 2) to each of the seams 27. The two seams 27 have the effect of subdividing the approximately forward half of manifold 3 into a central compartment 30 and two side compartments 31. Nevertheless, this still leaves the two layers 1 and 2 essentially unconnected with respect to each other with sufficient slackness in the inner layer so that it can collapse against the head to conform to all different types and sizes of hair settings or stylings. That is to say, seams 27 are insufficient to prevent the first form of the invention from operating as the second form of the invention illustrated in FIG. 4 wherein no seams 27 are used. Also, besides contributing to the turban-like appearance, seams 27 are helpful in centering the two layers 1 and 2 with respect to each other and the cap on the user's head.

Referring now particularly to FIGS. 2 and 3, typically the bottom of the cap comprising the band 7 and drawstrings 8 are positioned below the hairline of the cap user. This means that the areas 14–16 are positioned adjacent to bare skin portions such as the forehead, the ears and the back of the neck. However, these areas are not inflated so they do not get hot. The same is true of the area within seam 12. The portions of the inner layer immediately above the seams 12 and 17–19 are devoid of air hole openings 5 since these portions may be located opposite to or near bare skin or head portions having only very small amounts of hair. These portions of layer 1 which are immediately above the seams 12 and 17–19 get hot since they comprise part of manifold 3. However, they do not touch bare skin since they are spaced away from the head. As illustrated best in FIG. 2, when manifold 3 is inflated the inner layer 1 is caused to collapse against the hair curlers indicated generally by the broken line circles of FIG. 2 to conform to the contour thereof. However, the outer layer 2 is billowed outwardly and this causes the seams 12 and 17–19 to move away from the head. Therefore, the areas 14–16 and the area bounded by seam 12 and the portions of layer 1 immediately above seams 12 and 17–19 are spaced from the head. In FIG. 2 average size hair curlers are illustrated. However, with a smaller head or curlers the outer layer 2 would merely be spaced further away from the head or curlers to space the seams 12 and 17–19 and the areas of inner layer 1 contiguous thereto, both above and below, even further from the head while still permitting the inner layer closely to conform to the contour of the head and curlers. Thus, the seams 12 and 17–19 make it possible for the inflatable manifold to take up the excess material in the inner layer 1 while still having the excess material available to conform to larger hair settings. Of course, ultimately the drying air reaches the exhausts 6 which are adjacent to bare skin portions. However, by this time it cannot cause discomfort. This is because all the hot drying air is first forced to flow through the wet hair. In doing so its heat energy is transferred to the moisture in the wet hair as heat of evaporation. Therefore, by the time the drying air reaches exhausts 6 its temperature is significantly reduced so as not to cause discomfort to the bare skin adjacent exhausts 6.

Referring now to FIG. 4 of the drawings, illustrated therein is an embodiment of the invention just like the first form of the invention except that the seams 27 which interconnect the layers 1 and 2 from the forehead to the crown are omitted. The band 7 is shown against the head and the portions 15 would be positioned adjacent the ears. They are sealed off from the manifold by seam 18. Therefore, they do not cause discomfort even if in contact with the ears. The seams 18, which would also be true of the not shown seams 12, 17 and 19, are pulled away from bare skin portions by the billowed outer layer 2. This keeps the hot portions of layer 1 just above the seams 12 and 17–19 away from bare skin portions while still permitting the inner layer closely to conform to the set hair. The seams 12 and 17–19 in moving away from the head take up excess material or slack in the inner layer 1, but still, excess material is available in layer 1 to conform to larger hair settings.

While there have been shown and described particular embodiments of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and that it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A hair dryer cap, comprising two layers of flexible plastic material, each of said layers having the shape of a closed head cover which is open at its bottom portion to define a head receiving opening therein, one of said layers being perforate and the other layer being imperforate, the perforate layer being nested within the imperforate layer, said two layers being sealed closed to each other along their respective bottom portions, said perforate layer being loosely nested within said imperforate layer to provide an inflatable air space therebetween, means for admitting drying air into said air space comprising an air inlet opening in said imperforate layer, said layers being essentially completely free with respect to each other at the forehead, crown, side and rear portions of said cap and the head cover shape of said layers being substantially oversize with respect to a human head, whereby admission of drying air into said air space inflates the same to closely conform the perforate layer to a

large variety of hair settings differing from each other in style and size.

2. In a hair dryer cap as in claim 1, a continuous sealed connection between said two layers extending around said cap and above its ear portions, said air inlet opening being formed in the rear portion of the imperforate layer above said continuous sealed connection, aligned apertures formed in both layers in their respective rear and forehead portions below said continuous sealed connection for exhausting said drying air, and means for centering said two layers with respect to each other comprising another continuous connection between said two layers extending rearwardly from the forehead bottom portion of said cap to its crown portion.



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