

UNITED STATES PATENT OFFICE.

CHARLES VERO AND JAMES EVERITT, OF ATHERSTONE, COUNTY OF WARWICK, ENGLAND.

MANUFACTURE OF FELT HATS.

SPECIFICATION forming part of Letters Patent No. 284,924, dated September 11, 1883.

Application filed July 24, 1883. (No specimens.) Patented in England January 25, 1883, No. 423.

To all whom it may concern:

Be it known that we, CHARLES VERO and JAMES EVERITT, subjects of the Queen of Great Britain, residing at Atherstone, in the county of Warwick, England, felt-hat manufacturers, have invented certain new and useful Improvements in the Manufacture of Felt Hats, (for which we have received Letters Patent in Great Britain, No. 423, dated January 25, 1883,) of which the following is a specification.

Our invention has for its object improvements in the manufacture of smooth-faced napless felt bodies used for soft, flexible, and hard hats. We have succeeded in producing hat-bodies of a compound felt, mainly of wool, but with a surface of fur completely felted together and forming a fine napless face.

Our process is as follows: We prepare a woolen hat-body, in what is now the usual manner, by winding and accumulating the sliver from a carding-engine upon a conical form. The conical bat so obtained we proceed to harden. We place it, as usual, between two conical surfaces—an outer and an inner—and by a slight movement imparted to these surfaces, together with the application of steam to the fiber, the woolen bat is well hardened. A “flat hardener” may also advantageously be employed in hardening the body. The machine well known as “Froggatt’s Flat Hardener” is very suitable. When hardening with the flat hardener, it will be necessary to insert an “inlayer” into the folded body, to prevent the surfaces in contact adhering. It is usual to employ an inlayer of linen fabric; but we find it advisable to employ an inlayer of American water-proof cloth, as this material, being impermeable, leaves the face very smooth and in good condition to receive the fur. After the hardening, the face to be covered with fur may be further improved by singeing off any inequalities which may be found.

There are other known processes by which a hardened body may be produced—that is to say, by which wool or mixed wool and fur accumulated upon a cone may be consolidated into a firm flannel-like fabric without any great amount of shrinkage. We take the hardened hat-body and we place it upon the perforated

cone of the machine known as the “fur-former,” and in this machine we cause fine fur to be deposited onto the body. The fur we employ, by preference, is very short or shoddy fur, as this is both cheaper and better for our purpose than long fur. The air is exhausted from the interior of the cone of the fur-former, so as to cause an indraft through the hardened hat-body with which the cone is covered, and the fur is blown against the cone, as is usual when these machines are employed. The fur is deposited and held by the indraft of air upon the hat-body with which the perforated cone of the machine is covered. The process is continued until a suitable thickness of fur is accumulated, and then, while the suction is still continued, flannel cloths are carefully wrapped around the cone to keep the fur in place. An outer perforated conical cover of tin is then put on over the cloths and the two cones and the work between them are removed from the machine and immersed in hot water. When the body is thoroughly saturated, it can be safely unwrapped and removed from the cones. In this state it is taken first to a machine known as a “tip hardener.” It is placed upon the steam-heated cone of this machine, and there operated upon in the usual way by a palm, which is brought to bear upon the rounded apex of the cone, and is kept in constant movement. From the tip hardener the body with the fur upon it is taken to the flat hardener. In this machine the body is laid flat and pressed (but not on the folded edges) between two surfaces. The under surface is perforated for steam to permeate the work, and both surfaces have a short and rapid movement communicated to them. The body is crossed or refolded, as is always the practice in the use of the flat hardener, in order that the body may be equally operated upon all-around.

It will not be found necessary to employ an inlayer in this operation, for, the body being wet, its two surfaces in contact will not adhere. The slight oscillatory movement of the upper pressing-surface, aided by heat and moisture, causes the consolidation and hardening of the material between them and a satisfactory union of the finer surface material with the original

body is brought about. Care should be taken, especially at the commencement of this flat hardening operation, in order to prevent the formation of ridges in the fur. The operation
5 should be continued until such a union between the fur and the wool is obtained as will render the work able to bear the subsequent felting operation.

If it be required that the under side of the
10 brim of the hat should be faced with fur, (which; however, is frequently unnecessary,) fur is applied to the parts requiring it in the form of a bat stripped from the cone of the fur-former and trimmed to the desired shape. This fur
15 is combined with the under side of the brim of the body by a repetition of the process already described.

The whole of the fur required to cover the face as well as the under side of the brim may
20 be applied in this manner; but that which we have already described is preferable.

The hat-body is now ready for the felting operation. The felting is performed in the usual manner. The body, while saturated with
25 hot liquid, is subjected to a working or rubbing, commonly by means of rollers, and is frequently folded and refolded, which causes the fabric to felt up or thicken and shrink to perhaps half the size the body had at the com-
30 mencement of the felting. We employ in the felt operation water which is acidulated, but without very much acid, for if a great deal of acid were used the felting of the fur might take place too rapidly and produce ridges in
35 the body; also, to avoid too rapid felting, we sometimes use fur which has not been subjected to the ordinary preparatory process of "carrotting;" but when only very short fur is employed there is no risk of too rapid felting.

40 The felting and the finishing operations are conducted as is usual in making felt hats from wool, for these hats, having a woolen body, do not require the gentle treatment necessary when fur alone is employed, especially when
45 a large proportion of the fur is short.

In the felting operation both the wool and the fur become thoroughly felted and combined, so as to form one solid napless felt. The

fur does not penetrate to an injurious extent among the wool, in consequence of the woolen
50 body having been already well hardened before the felt is placed upon it and the union of the surface felt of fur and the woolen felt within is complete, and the compound felt forms
55 evenly and without ridges, because the felting and shrinking of the entire double felt take place at the same time. If the shrinkage of the woolen body were effected before the fur were placed upon it, a satisfactory union could
60 not be obtained.

Long fur forming a flowing nap can be applied to a woolen body which has been already shrunk and felted, and this has sometimes been done; but the article produced is entirely
65 different from that which forms the object of our invention. The fur remains loose, it does not produce a felt in itself, and the independent fibers have only a surface attachment with the body of the hat.

Our invention does not apply to the manu-
70 facture of napped hats. The hat-body which we produce is smooth and napless, and the fur makes a complete felt covering, and perfectly united with the woolen felt beneath.

Having thus described the nature of our said
75 invention and the manner of performing the same, we would have it understood that we claim—

1. The process of combining a fur cover with a hardened and unfelted body by bringing the
80 same together, operating upon them with a flat hardener, and afterward felting the compound body, substantially as described.

2. The process of obtaining a deposit of fur upon a hardened woolen body by blowing the
85 fur onto the body in a fur-former, then hardening the fur thereon, and afterward felting into a compound felt, substantially as described.

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