July 10, 1962 L. RONA 3,042,991

ARTIFICIAL FUR OR THE LIKE

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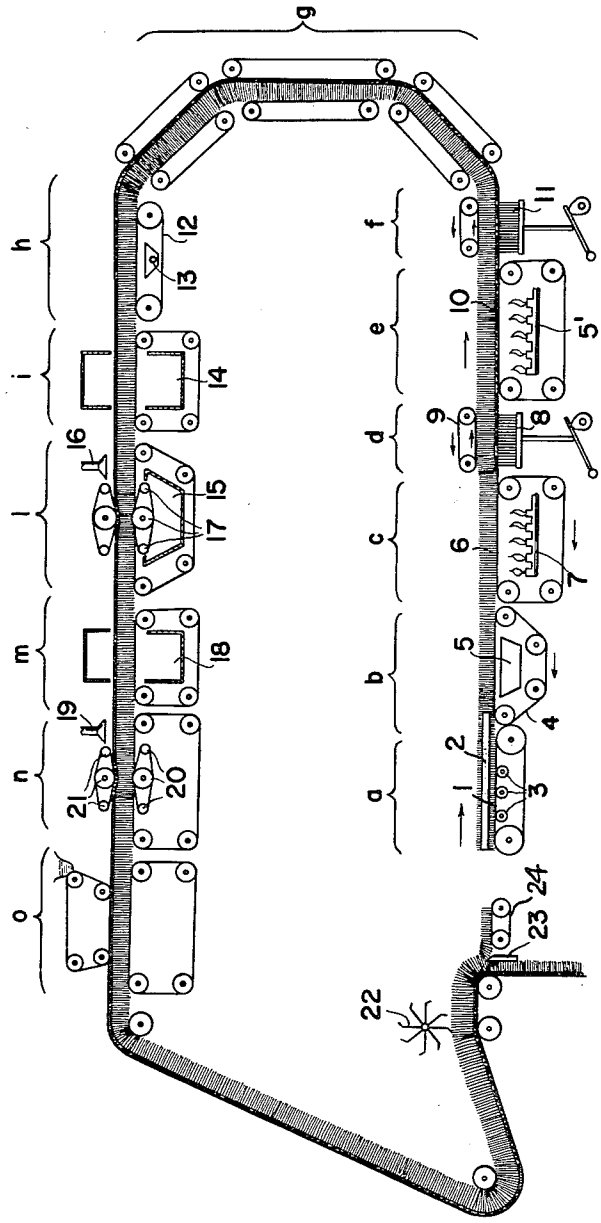


FIG. 1.

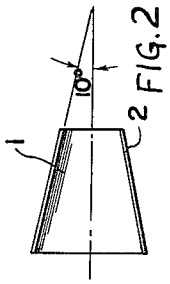


FIG. 2

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FIG. 3.

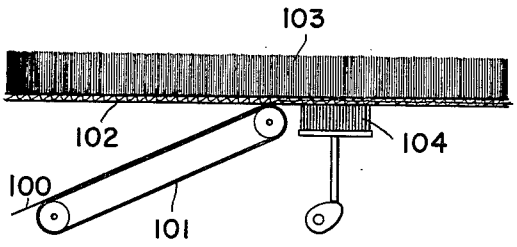


FIG. 4

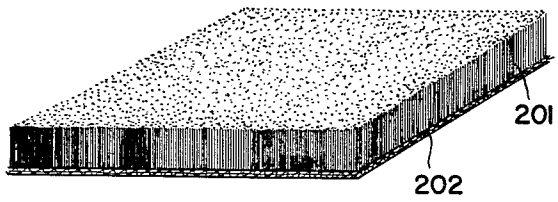


FIG. 5.

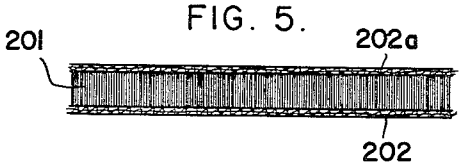


FIG. 6.

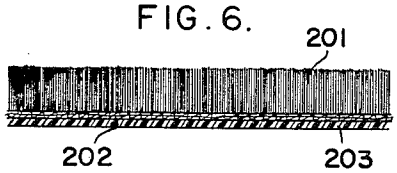
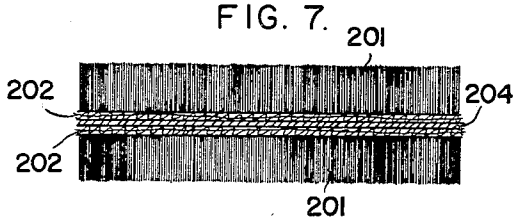


FIG. 7.



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ARTIFICIAL FUR OR THE LIKE

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Filed Feb. 26, 1958, Ser. No. 717,710
5 Claims. (Cl. 28—79)

The present invention relates to a novel artificial fur product or the like comprising a layer of animal hair or fibers, the depth of which depends upon the length of the fibers, which are arranged in parallel with each other. This layer comprises a felted zone which attaches the fibers to each other and which extends over at least one side of the layer.

This invention also provides a process for the manufacture of this novel product.

In my earlier patent application, Serial No. 578,876, filed April 18, 1956 (now abandoned) I have disclosed the artificial fur products in accordance with my invention and the method of making the same, and to that extent the present specification is a continuation in part of my earlier disclosure. In addition to product and method described in my earlier disclosure, the invention also provides apparatus for practicing the method and producing the products.

It is one object of the invention to provide a material comprising a layer of animal hair or fibers extending vertically in respect of the plane of said layer in one portion of its depth and matted together in another portion, thereby forming a felted layer which retains the matted fiber-ends and constitutes the support of same.

The nearest approximation to the product of the present invention hitherto known is that of a layer of fibers or hairs similarly arranged in parallel with each other at one extremity and there forming a surface where these extremities are fixed by means of adhesives to a sheet of material which becomes the foundation of the fibers.

Both the processes outlined above can be used to produce an article that has exactly the same appearance as that of natural fur, with this difference however, that while the known process provides a base or supporting foundation for the fibers or hairs consisting of a foreign material, according to the present invention this base or supporting foundation consists of the extremities of the fibers or hairs matted or tangled amongst themselves, so as to form a felt-like zone.

It is another object of this invention to provide a product formed by the union of two layers of fibers or hairs of the nature already disclosed, joined to each other in their felt-like zones by means of any known process.

It is still another object of this invention to provide a product consisting of a layer of animal fibers or hairs arranged in parallel, alongside each other, having a felt-like zone on each of its sides, formed by the respective ends of said fibers or hairs.

It is still a further object of the invention to provide apparatus constituting the necessary plant for practicing the method and making the product in accordance with the present invention.

This invention furthermore includes a product constituted by a layer of fibers or hairs arranged in parallel amongst themselves, said hairs or fibers being held together reciprocally at one common extremity and including a plurality of additional fibers or hairs which extend in a substantially normal or similar plane to that of the aforementioned layer of fibers or hairs.

Further objects and details of the invention will become apparent if reference is had to the accompanying drawings in which—

FIG. 1 is a diagrammatic illustration of a plant for producing one of the products described in this specification.

FIG. 2 is a plan view of the first process station in accordance with FIG. 1;

FIG. 3 diagrammatically illustrates the manner in which additional fibers of hairs are fed to the felt-like zone of the hairs or fibers as in stations *d* and *f* in FIG. 1;

FIG. 4 is a sectional view, in perspective, of a portion of plush and felted product, consisting of a single fibrous or hairy material.

FIG. 5 is a sectional view of a layer of plush or hair between two layers of felt formed of the same material.

FIG. 6 is a sectional view of a layer of fibers or hairs the felted portion whereof has a backing of plastic material.

FIG. 7 is a sectional view of a plush like product constituted by joining two felted surfaces by means of a layer of plastic material.

The process of the present invention, leading to the above described product can be initiated with clipped hairs, fleeces of wool, or natural animal skins.

Starting with clipped hairs, such as raw unwashed wool for example the fleece is fed into the first station of the process *a* illustrated in FIG. 1 and is distributed upon a horizontally moving surface **1** where it is opened and set by hand. Due to their natural elasticity, the hairs or fibers straighten themselves out and settle in a vertical position with respect to the plane of the moving supporting surface.

The maintenance of this vertical position of the fleece is assisted both manually and mechanically in that the supporting surface moves between side guides **2** consisting of endless metallic bands positioned at an angle with respect to the axis of movement of the said supporting surface, so that the distance between the side guides decreases slightly in the direction of movement of the wool. Being endless the side guides **2** extend totally around the path of movement of the hairs during the manufacture of the artificial fur.

The method of arranging the fibers or hairs perpendicularly with respect to the transporting surface is simpler than would appear to be the case, as the fleece is formed by a plurality of blocks, wherein the fibers are stuck together by impurities (burrs etc.) at the ends opposite to those formed by cutting or clipping them from the skin.

This peculiar property of unwashed fleece is known and is taken advantage of in the regular process of classifying the wool.

In the course of experimental research, trials were made with an endless canvas band as the movable surface. The upper portion of the surface was slidably supported by a plurality of loose rollers **3** whereby the arrangement of the fibers upon the surface was facilitated by preventing sagging of the surface under the weight of the wool.

The width of the canvas belt may vary according to the desired width of the finished product. Experiments were made with widths of 70, 90, and 120 cm.

The angle of the side guides with respect to the longitudinal axis of the canvas may vary between 5 and 15 degrees according to the density of the fibers or hairs desired in the finished product.

After the fibers or hairs have been arranged vertically and in the desired density, they pass to station *b* where they are transferred to another conveyor **4** consisting of an endless belt of fine wire mesh. Conveyor **4** surrounds vessels **5** containing detergent substances such as water, soap, alkali, etc., at boiling temperature where

the lower extremities of the grouped fibers or hairs are washed and softened.

These solutions, maintained at boiling temperatures, soak the lower extremities of the fibers or hairs. These fibers or hairs are then transported to the next station C where they are moved by another endless belt **6**. Good results have been obtained by making this latter belt of sheet brass of 0.7 mm. thickness and heating it by any suitable method, such as gas flames **7** which can be disposed in the space between the horizontal portions of the endless belt.

The action of heat upon the soaked and alkalized extremities of the fibers imparts to them a tendency to curl, thereby starting the first stage of felting.

The layer of fibers is now advanced to station *d* where it is subjected to a beating by a brush **8** having a rapid vertical reciprocating movement of less than 1 mm.

The layer is caused to move forward by the mechanical pressure of the fibers being fed into this stage from the endless heated belt **6**.

Another endless belt **9** moving in the same direction as that on which the fibers are pushed is provided for contacting and covering the working surface of the layer opposite to brush **8** and assists in transporting the fibers.

The brushes tested were of the same width as the layer of fibers and were provided with openings at the edges corresponding to the entry of the arriving layer of fibers, whereby a hot solution of liquid soap could be ejected under pressure.

The felting of the lower portion of the layer of fibers is increased as the effect of the beating of the points of the brushes against the bent extremities of the fibers produces tangling or matting among them. This effect is intensified by passing the layer upon another heated endless belt **10** through station *e* similar to that already described and through still another station *f* of felting by means of a second brush **11**. The number of these stations of alternate heating and felting is variable, depending on the type of material being treated and the depth of the layer of felt it is desired to obtain.

Having completed the felting step, the layer of material being treated is now reversed, as indicated at station *g* and is then transported onto an endless belt of metal wire screen **12** to station *h* (optional for the type of fleece carrying burrs). Screen **12** passes over a sprayer **13** which sprays a dilute solution of sulphuric acid against the outer surface of the fleece to initiate carbonization of the vegetable matter. Great care must be taken to maintain the pressure of the spray within certain limits so as to prevent any liquid from penetrating further than the outer layer of burrs on the fleece.

The felted fleece is then transported through a heated drying chamber **14** at station *i* (also optional), where the vegetable impurities (mainly consisting of burrs) are carbonized. The fleece is then transported to a washing station *l*, still lying on the same endless belt, where it receives a gentle shower of hot water **15** upon the felted surface of the moving layer from a series of fine nozzles **16**. The fleece is then dried by being lightly pressed between rollers **17**, the upper of which is surrounded by a metallic band and heated to about 200° C. by any suitable means such as electricity. The lower roller **17** is surrounded by a metal cloth belt that allows the excess liquid to run off.

This step results in a still firmer engagement between the hairs that form the felt-like layer and this layer is thereby strengthened and better prepared for the following step of drying.

The layer of material under process is now transported, always on the same endless belt of metal cloth to station *m* where it passes through at least one drying chamber through which hot air is circulated.

The number of these drying chambers depends upon the length of the fibers or hairs and the density and class

of the material being treated which has to be brought to a state of perfect dryness.

Finally, the felted surface of the material being treated is sprayed lightly at station *n* with a solution of formaldehyde by spray **19**. This solution may contain, for example, 800 cc. of formalin, 200 cc. of water and 25 cc. of hydrogen peroxide. At the same time the surface is again gently pressed between hot rollers **20** and **21**, of which the latter are in contact with the felt-like layer and are provided with heating means to complete and fix the union of the hairs in the felted portion.

As a result of the formaldehyde treatment the curled or hooked fiber ends become fixed in their shape by the formaldehyde penetrating into their interior where the formaldehyde solidifies upon being heated, thus preserving the shape of the fiber ends.

From this station the material under process can be transported to other optional stations such as station *o* where the outer surface of the felted portion may be lined or covered with a fluid plastic substance such as latex or synthetic resin to form a film or support closely adhering to the felted portion. Station *o* may be used to form a layer or sheet support of any suitable material by any process known in the art.

The material under process finally passes through a carder **22** and under an adjustable endless cutting blade **23** the axes of which extend in a plane perpendicular to that of the material treated. The cuttings from this cutter are collected upon a conveyer belt **24** arranged at the same level and practically in continuation of the cutting blade. Belt **24** can have the same constructive characteristics as that of the conveyer belt **1**, if the length of these cuttings is sufficient to justify their treatment in the same manner as that of the layer from which they were cut.

FIG. 2 illustrates the angular disposition of the side guides **2** with respect to the geometric axis of the conveyer belt **1**.

FIG. 3 shows how a layer of flat-lying fibers or hairs **100** fed by an endless belt **101** to the felted layer **102** of a layer of fibers or hairs **103** is incorporated in said felted layer **102** by the action of a beater brush **104**.

This additional layer of fibers or hairs can also be attached to the felted layer by means of latex or a liquid plastic material.

FIG. 4 shows one embodiment of the product of this invention consisting of a series of fibers or hairs arranged in parallel with each other, forming a plush like zone **201** and a felted layer **202**.

FIG. 5 shows an embodiment of this invention wherein a plush-like zone **201** is sandwiched in between two felted layers **202** and **202***a*. In this embodiment the artificial fur is made in accordance with the process described wherein the free ends of the hair have likewise been treated and felted.

FIG. 6 shows another embodiment of this invention comprising a layer of fibers or hairs forming a plush-like zone **201**, a felted layer **202** and a layer of plastic material **203** backing and supporting the said lower felted layer **202**.

FIG. 7 shows yet another embodiment of this invention, comprising two layers of fibers or hairs, each one of which comprises a plush like zone **201** and corresponding felted layers **202** and includes a layer of plastic material **204** by means of which the said felted layers are united. In this embodiment two artificial furs are produced according to the process disclosed wherein the felted layers of these two furs are joined together by means of a plastic layer or a suitable adhesive.

Having now described my invention with reference to the various embodiments illustrated, I do not wish to be limited thereto but what I desire to protect by Letters Patent of the United States is set forth in appended claims.

1. An artificial fur product comprising a material such

as hair, wool or the like severed from the skin of an animal, said material being arranged in a continuous piece in substantially the same relative position as it occupied on the skin of the animal from which it was cut, said hairs, wool or the like of said material at a common end thereof being matted to form a felted layer in said material, said layer supporting and retaining the free ends of said hairs, wool or the like extending therefrom in said same position.

2. An artificial fur product comprising a material such as hair, wool or the like severed from the skin of an animal, said material being parallelly arranged in a continuous piece in substantially the same relative position as it occupied on the skin of the animal from which it was cut, said hairs, wool or the like of said material at a common end thereof being matted to form a felted layer in said material, said layer supporting and retaining the free ends of said hairs, wool or the like extending therefrom in said same position.

3. An artificial fur product comprising a material such as hair, wool or the like severed from the skin of an animal, said material being arranged in a continuous piece in substantially the same relative position as it occupied on the skin of the animal from which it was cut, said hairs, wool or the like of said material at a common end thereof being matted to form a felted layer in said material, said layer supporting and retaining the free ends of said hairs, wool or the like extending therefrom in said same position, said felted layer being externally coated with a layer of plastic material.

4. An artificial fur product comprising a material such as hair, wool or the like severed from the skin of an animal, said material being arranged in a continuous piece in substantially the same relative position as it occupied on the skin of the animal from which it was cut, said hairs, wool or the like of said material at each of their common ends being matted to form felted layers in said material.

5. An artificial fur product comprising a material such as hair, wool or the like severed from the skin of an animal, said material being arranged in a continuous piece in substantially the same relative position as it occupied on the skin of the animal from which it was cut, said hairs, wool or the like of said material at each of their common ends being matted to form felted layers in said material, each of said felted layers being externally coated with a layer of plastic material.

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