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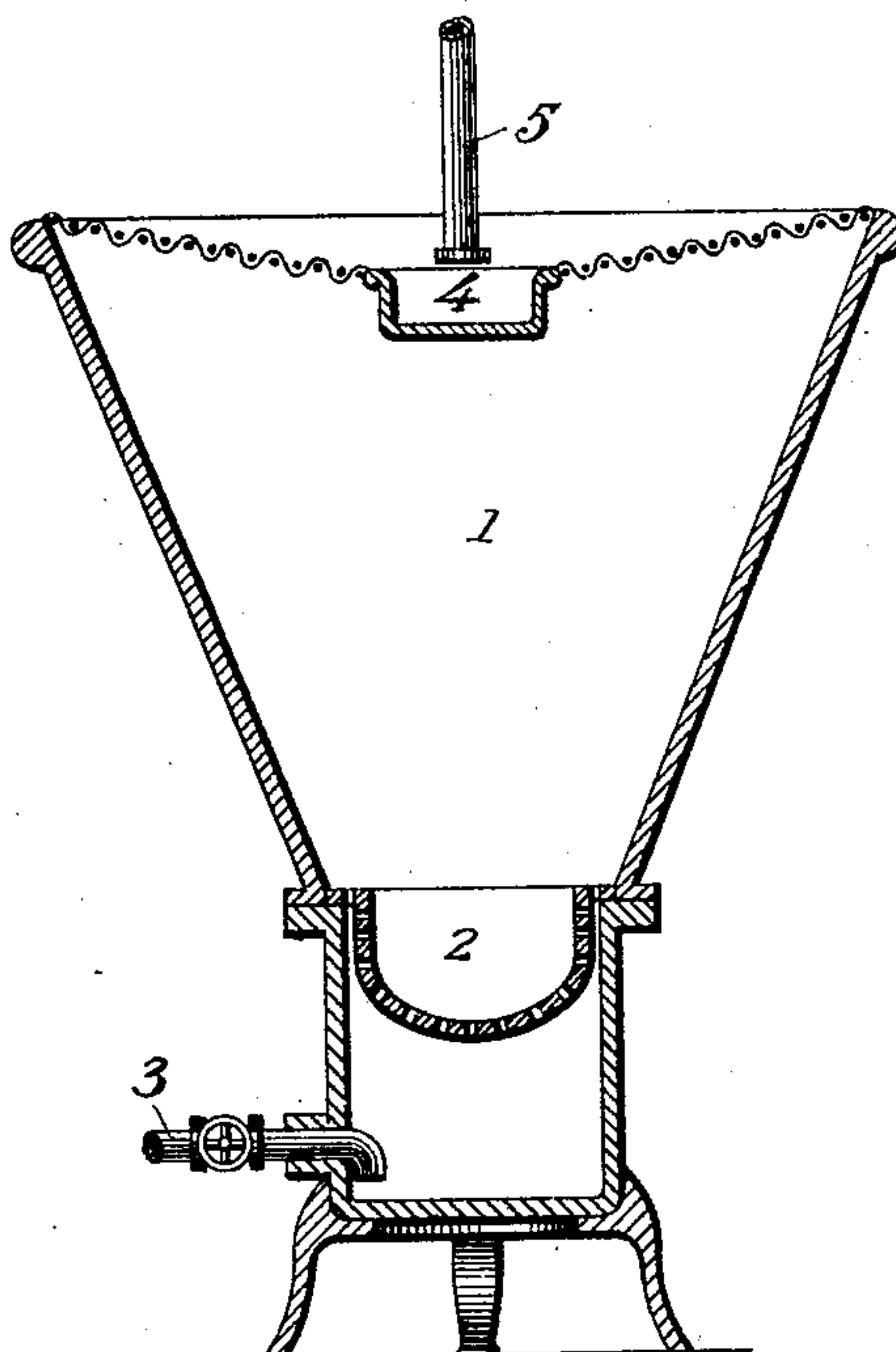
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J. H. NEAVE.

METHOD OF MAKING HATS AND ARTICLE PRODUCED THEREBY.

(Application filed Oct. 19, 1900.)

(No Model.)



Witnesses
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JOHN HENRY NEAVE, OF MACCLESFIELD, ENGLAND.

METHOD OF MAKING HATS AND ARTICLE PRODUCED THEREBY

SPECIFICATION forming part of Letters Patent No. 699,222, dated May 6, 1902.

Application filed October 19, 1900. Serial No. 33,547. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY NEAVE, of Rainow, near Macclesfield, county of Chester, England, have invented a new and useful
5 Improvement in Methods of Making Hats and Articles Produced Thereby, of which the following is a specification.

This invention relates to a method of making hats possessing in appearance, texture,
10 and other details the characteristics of a felt hat.

The objects of the invention are to avoid the greater part of the usual laborious felting process and to utilize a material of shorter
15 staple than that commonly employed in producing the ordinary felt hat.

The usual process of forming felt hats from wool or fur consists in laying the fibers one over another in such manner as to admit of
20 their being conveniently felted together to form the hat-body. The felting operation comprises a treatment of the body by kneading, rolling, and pressing, whereby the fibers in a moist condition are caused to interlace or
25 knit together in such manner as to form a compact fabric, usually of a conical form, which is stretched or blocked to the desired shape. Many hats are required to be of a greater degree of firmness and solidity than can be ob-
30 tained from a felted material alone, and to meet this condition it is usual to saturate the felted body with a stiffening material, such as a solution of gum, commonly shellac, the solution being either brushed onto the hat-
35 body or the latter steeped in the solution, and the surface finally cleansed by suitable means known in the art. It is seen that under such a process a material possessing a long staple must be employed in order to admit of the
40 proper degree of felting, and, further, in order to consolidate and concentrate the fibers to produce a felted material of the proper firmness and solidity it has been necessary to subject the fibers to the series of laborious and
45 tedious steps constituting the felting process before the stiffening material was applied.

Now by my new method the stiffening material is deposited on the individual and distinct fibers unmixed with any pulpy matter,
50 and a body containing this stiffening material is afterward so treated that it is consolidated and stiffened, the stiffening material serving

both to firmly bind the fibers together and render the hat stiff and firm. By this improved method, therefore, the integrity of the
55 body is not due alone to a felting action or knitting of the fibers, but to the stiffening material introduced during the building up of the body. Hence there is no necessity for the employment of fibers of long staple nor for the
60 usual felting process.

The stiffening material may be introduced with the fibers in the formation of the body in various ways, either directly in pulverulent, granular, or powdered form, or the fibers may
65 be treated chemically in connection with a solution of the stiffening material to cause a precipitation of the stiffening material directly on the individual fibers, or a precipitation of the stiffening material from its solution may
70 be effected in the presence of the fibers and the precipitate strained out onto the fibers in the process of building up the body, depositing on individual and distinct fibers, unmixed with any pulpy matter, a binding material,
75 which when heated serves as the sole means for holding the fibers together and which preserves the integrity of the hat.

In the accompanying drawings I have represented one form of apparatus suitable for
80 carrying my method into effect; but it may be carried out in other ways and by apparatus of a different form.

Referring to these drawings, 1 represents a tank containing in its base a perforated hat-
85 form 2 of any desired shape and a pipe 3 for withdrawing water through the form.

4 represents a pan onto which the supply of water is directed, which pan serves to break the force of the water entering the tank and
90 prevents disturbance in the tank during the process of building up the body. In forming a body by this apparatus the tank 1 is filled with water and a supply of fur or wool or other fiber, such as silk or alpaca, is intro-
95 duced. The taps in the exit-pipe 3 and supply-pipe 5 being opened a current of water will pass through the tank, carrying with it the loose fibers and depositing them in concentrated condition on the form. When this
100 layer has been thoroughly deposited, a second supply of wool or fur mixed with a stiffening material in granular or pulverulent form, preferably gum-shellac, is introduced

in the tank and in its turn is deposited on top of the first layer or strata. When this is accomplished, a third layer of fur unmixed with the stiffening material may be introduced. There will then be deposited on the hat-form a body of the usual form of the hat, consisting of two outer layers of unmixed fur and an intermediate layer of fur mixed with the stiffening material in pulverulent form. This body is now removed and dried and subjected to pressure to consolidate the mass and to sufficient heat to melt the shellac, which on setting will bind the fibers together and stiffen the body. The hat is now practically finished, it only remaining to curl the brim. When formed in this manner, there will be no necessity for cleaning the surface of the hat of the stiffening material, as a free nap from the outside layer of unmixed fur will adhere to the outer surface of the intermediate mixed layer.

Instead of depositing on the hat-form separate layers of fur mixed and unmixed with the stiffening material, as just described, the entire body may be deposited as one layer of fur mixed with the stiffening material. In such a case it will be necessary after the body is pressed and subjected to heat to clear the surface of the stiffening material. This may be done by the usual and well-known methods, such as by steam or by the aid of an alkaline bath or other means known in the art.

In proceeding as above described it is evident that the stiffening material must be in granular or other finely-divided condition to admit of its being deposited equally and thoroughly throughout the fibers of the material.

I have found that the most satisfactory results may be obtained by treating the fibers chemically in connection with a solution of the stiffening material to cause a precipitation of the shellac or other gum directly on the fibers. This treatment of the fibers is effected before they are deposited on the hat-form, so that when deposited the fibers will have attached to them the stiffening material. To accomplish this, the shellac or other gum is reduced to solution by boiling in alkali, while the fibers are steeped in an acid solution for a sufficient time to permit them to become impregnated with the acid. The excess of acid being poured off, fresh water is added, and the solution of shellac is poured into the vessel with the acid-treated fibers, the result being that the acid in the wool will combine with and separate the alkali from the shellac and the latter will be left as a precipitate on the individual fibers. The fibers, with the shellac thus attached, may now be deposited by the apparatus described onto the hat-form and subsequently pressed and heated to condense the body and cause the shellac to coalesce and bind the fibers firmly together. Instead of causing this precipitation on the individual fibers as thus described the alkaline shellac solution may be

poured into an acid-bath containing the fibers in the tank of the apparatus, which will result in the precipitation of the shellac, which when the liquid is withdrawn through the hat-form will be left with the fibers on the form.

While I have described my invention as applicable to cases where the building up of the hat-body is effected by drawing the water containing fur in suspension through a perforated hat-form to leave the fur as a deposit thereon, it will be understood that the invention is not limited to this method of forming the body, but is applicable as well to the other ways of making the body—for instance, by blowing the wool or fur on the hat-form, in which case the stiffening material may be also blown on with the fibers—the essential feature being that the stiffening material be introduced with the fur or wool during the formation of the body and not after the body is felted.

The invention comprehends also the improved hat formed by the processes described.

I am aware that it has been proposed to make a hat by mixing with wood-pulp a binding material, such as shellac, forming the hat from this mixture, and heating it to melt the shellac. My hat and the manner of forming the same differ from this manner of procedure, in that I deposit on the individual and distinct fibers, unmixed with any pulpy mass, a binding material, which when heated serves as the sole means for holding the fibers together and which preserves the integrity of the hat, whereas in the old form above described the pulp constituted, in effect, the primary means of holding the fibers together, the shellac being used mainly for the purpose of giving the mass such characteristics that it could be readily molded into shape.

I am also aware that it has been proposed to form sheets for use in the manufacture of hats by mixing india-rubber, gutta-percha, naphtha, &c., and hair or wool, which mixture has been subjected to the action of wetted rolls. In my hat, however, there is incorporated with flexible fibers a binding material which after the body is formed by a building-up process and given the proper shape serves to bind the fibers together and preserve the form of the hat.

Having thus described my invention, what I claim is—

1. The process of making hats from wool, fur or analogous fibers, which consists in progressively building from the fibers a body of the general form of the hat, incorporating in the fibers as the formation of the body progresses, a stiffening material, and finally treating the formed body to cause the material to stiffen and bind the fibers together and preserve the integrity of the body.

2. The process of making hats from fur, wool or like fibers, which consists in depositing on the fibers a stiffening material, progressively building up from said fibers a body

of the general form of the hat, and finally treating the body to cause the stiffening material to bind the fibers together.

3. In the process of making hats from fur
5 or wool or like fibers treating the fibers with an acid, subjecting them to an alkaline solution of resin whereby the resin will be precipitated on the fibers, and forming a body from the fibers thus treated.

10 4. The method of making hats from fur or wool or like fibers which consists in treating the fibers in an acid-bath to cause the acid to impregnate them, providing a solution of resin and alkali, subjecting the fibers to the action
15 of this solution to precipitate the resin, forming a body of fibers thus treated, and finally treating the body to cause the resin to coalesce.

20 5. The improved hat consisting of a non-felted body composed of fur or wool or like

fibers of short staple bound together wholly by a binding material incorporated among the fibers and serving as the sole means of preserving the form and integrity of the body.

6. The improved hat consisting of a non-
25 felted body composed of fur or wool or like fiber of short staple bound together wholly by a binding material incorporated among the fibers, the said body having a distinct surface covering of fibers free from a binding
30 material but united to the body by the same material that binds together the fibers of the said body.

In testimony whereof I hereunto set my hand, this 10th day of October, 1900, in the
35 presence of two attesting witnesses.

JOHN HENRY NEAVE.

Witnesses:

ERUALD SIMPSON MOSELEY,
JOHN WILLIAM THOMAS.