

UNITED STATES PATENT OFFICE.

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PROCESS FOR MAKING CLOTH SUBSTITUTE

No Drawing.

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To all whom it may concern:

Be it known that we, MICHELE ANGELO Besso, engineer, a citizen of the Swiss Republic, and residing at Rome, in the Kingdom of Italy, and F PAUL HABICHT, engineer, a citizen of the Swiss Republic, and residing at Schwanden, Switzerland, have invented a certain new and useful Process for Making Cloth Substitute, of which the following is a specification.

The object of the present invention is to produce a cloth substitute formed of fibres rendered sticky so that the fibre sticks to another, however, only for a relatively short portion of its length. Such material, which hereafter will be called "the fleece," can be folded and considerably deformed without undergoing any change whatsoever and it is therefore fit to be used instead of a common cloth.

The "fleece" can, for instance, be formed of cotton fibres or of other cellulose fibres; the adhesion of these fibres one with another can be obtained by causing a solvent of the cellulose to act superficially upon them (viz ammoniacal copper oxide or acetic anhydride) so that they may stick together at each crossing point, such adhering parts being, however, short in comparison with the entire fibre's length. The process of solution of the cellulose fibres being slow, the fibres preserve their form for a long time; should a thin layer of fibres soaked with such a solvent be formed, the points of contact where they can adhere, are always short portions of the total length of each fibre.

Having submitted the fleece thus formed to a fixing process, through the neutralization or evaporation of the solvent, for instance, the adhesion of the fibres will be such as to allow the material being washed with plain water or soap-water, etc., and it can also undergo extensions and flexions just like a cloth without being damaged.

The fleece can be formed with the usual means adopted for the manufacture of paper, that is to say by suspending the fibres in a liquid so as to form a pulp which is allowed to settle in a very thin layer upon a filtering or absorbing surface through which the liquid passes leaving behind the

layer of wet fibres which is treated as above pointed out after it has become dry.

Instead of using a liquid to keep the fibres in suspension, the action of whirling air can be utilized for the same purpose, causing them afterwards to be carried by a current of air which allow them to set down in the manner required.

For such a purpose a closed space is prepared within which the fibres are kept suspended by a whirling movement of the air, which is then aspirated from the upper end closed with a sieve or wire cloth.

The fibres, carried up by the sucking current, settle against the wire-cloth and form a layer of uniform thickness which gradually obstructs the holes of the wire cloth and therefore slackens the current of the air. The settlement of the fibres ceases when the ascending current of air has slackened enough to be unable to carry the fibres upwards any more.

On the layer thus formed is sprinkled the solvent in tiny little drops. Or, in order to obtain the adhesion, the solvent is applied by means of printing rollers which distribute it along continuous or dotted lines.

To contrast the tendency of the solvent to diffuse by reason of its capillarity, a tendency which would prevent the localization of the adhesive effect, it is advisable to sprinkle or otherwise to apply together with the solvent another nonsolving liquid which will not mix up with it, oil for instance.

Also the atomized solvent can be caused to act on the suspended fibres before they settle against the wire cloth. In thus doing care must be taken to choose the proportions in such a way that the quantity of the solvent be enough to moisten the fibres, but small in comparison with the total volume of the interstices of the fleece: this precaution is necessary in order that the fibres do not stick except in the points wherein they cross one another; for it is towards these points that the capillarity will cause the solvent to collect. Also in this case the fibres will not therefore adhere except on relatively short portions of their total length.

The cloth substitute can also be produced directly in a final form, apt, for instance, to

be used as a garment, by giving to the sucking support whereon the fibres are deposited a corresponding form.

We do not claim the use of the solvent to partially dissolve the fibrous material employed; but as distinguished therefrom, what we claim is:

Claims:

1. A process for the formation of a cloth substitute comprising the suspension of cellulose fibres in a current of air, the sprinkling of a solvent of the cellulose on such fibres while the latter are still suspended in the air, their settlement in a layer of a uniform thickness on the surface of support, a sieve, wire cloth, and the like—through which the air may pass, in such a way that, through the effect of the solvent with which they have been moistened, the fibres may adhere in their crossing points.

2. A process for the formation of a cloth substitute comprising the suspension of fibres in a suitable fluid and the application to the fibres of a solvent liquid, the process of solution of fibres being made to cease when the fibres have almost their original elastic properties, as to bending, so that they will touch and, therefore, adhere together but on relatively short portions of their length.

3. A process for the formation of a cloth substitute, including the suspension of cellulose fibres, cotton fibres and the like, in a convenient fluid, and the application to the fibres of a solvent of the cellulose, and also a non-solvent liquid, as oil, which does not mix with the solvent, thereby producing the adhesion of the fibres in their crossing points.

4. A process for the formation of a cloth substitute, comprising the suspension of

cellulosic fibres in a current of air, and the application to the fibres of a solvent to the cellulose and a non-solvent liquid which does not mix with the solvent thereby causing the adhesion of the fibres in their crossing points.

5. A process for the formation of a cloth substitute having a non-closed, naturally porous structure comprising the suspension of fibres in a suitable fluid, and the application to the fibres of means to cause the fibres to adhere together so localized and for so long a time that they adhere together but on relatively short portions and consequently secure the natural porosity and mobility of parts of a woven fabric.

6. A process for the formation of a cloth substitute having a non-closed, naturally porous structure, comprising the suspension of fibres in a suitable fluid, their settlement in a layer of uniform thickness on the surface of a support and the application to the fibres of means to cause the fibres to adhere together so localized and for a sufficient time that they adhere together but on relatively short portions, and consequently secure the natural porosity and mobility of parts of a woven fabric.

In testimony whereof I have signed my name in the presence of two subscribing witnesses, at Rome in the Kingdom of Italy this 22nd day of April 1919.

MICHELE ANGELO BESSO.

Witnesses:

LETTERA LABOUELLA,

ANTONIO LABOUELLA.

In testimony whereof I have signed my name at Zurich, Switzerland, this third day of May, 1919.

F PAUL HABICHT.