June 4, 1935. J. A. HOWARD 2,003,935

MANUFACTURE OF UPHOLSTERY PADDING

Filed July 10, 1934 3 Sheets-Sheet 1

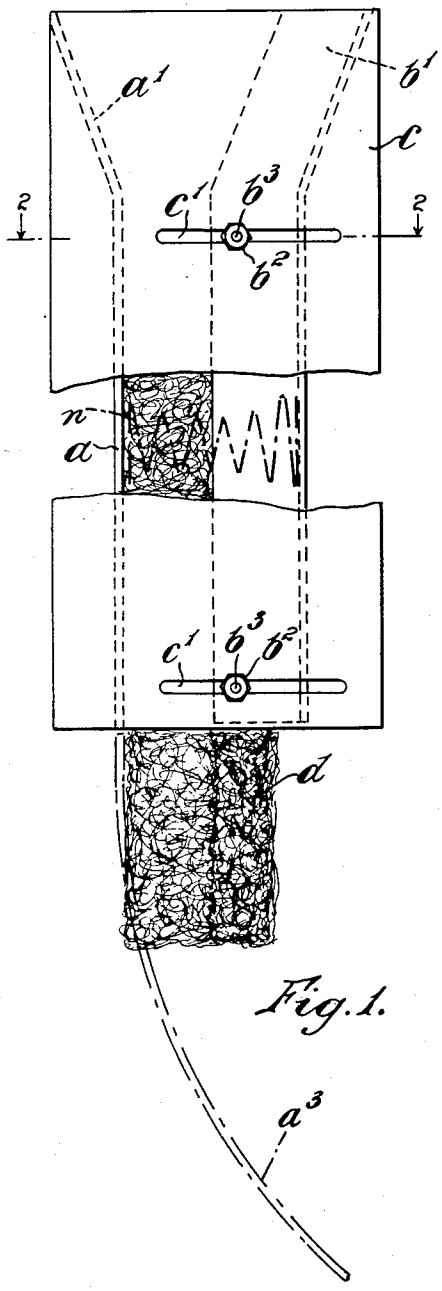


Fig. 1.

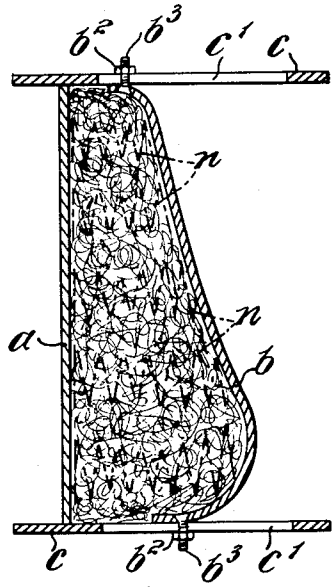


Fig. 2.

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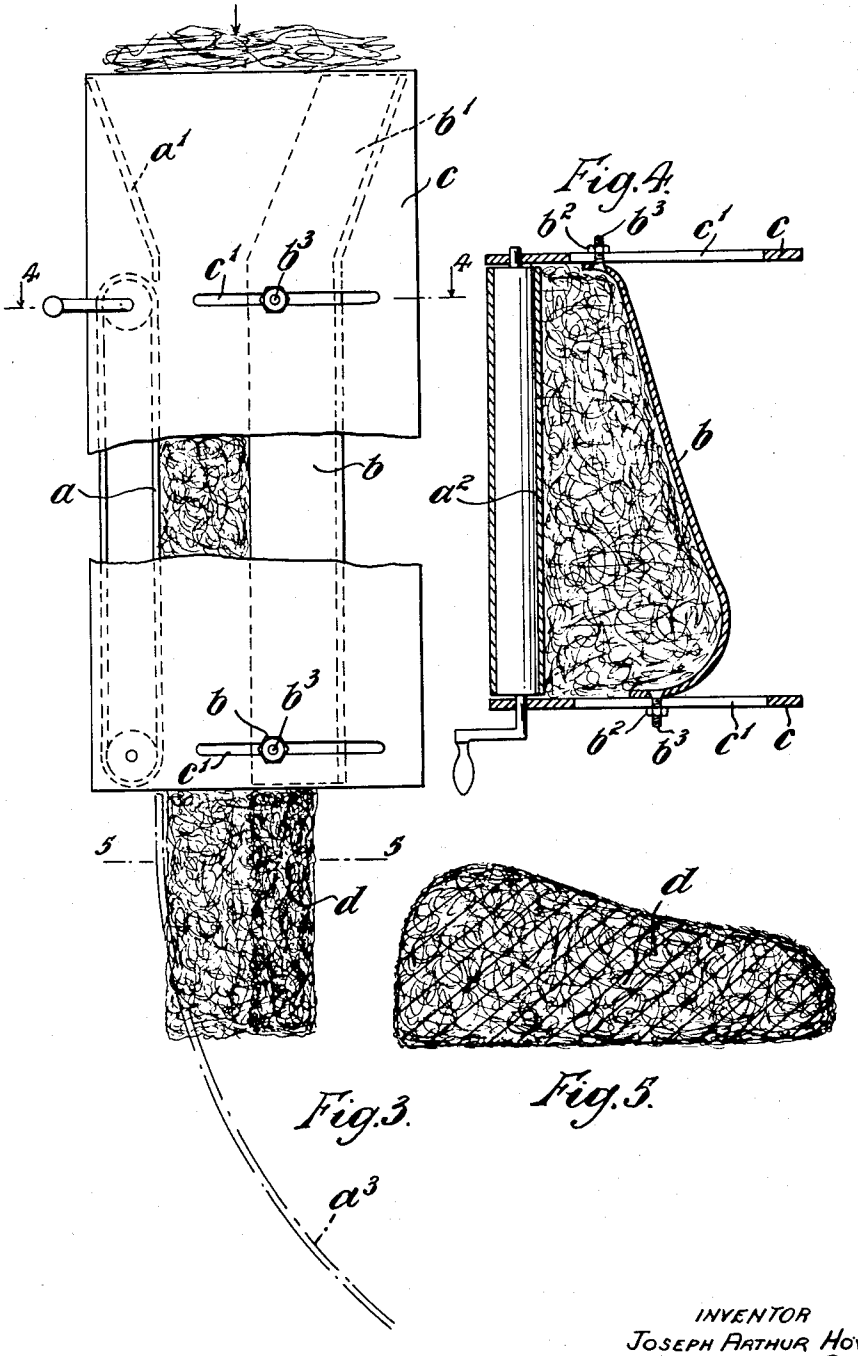


Fig. 3.

Fig. 4.

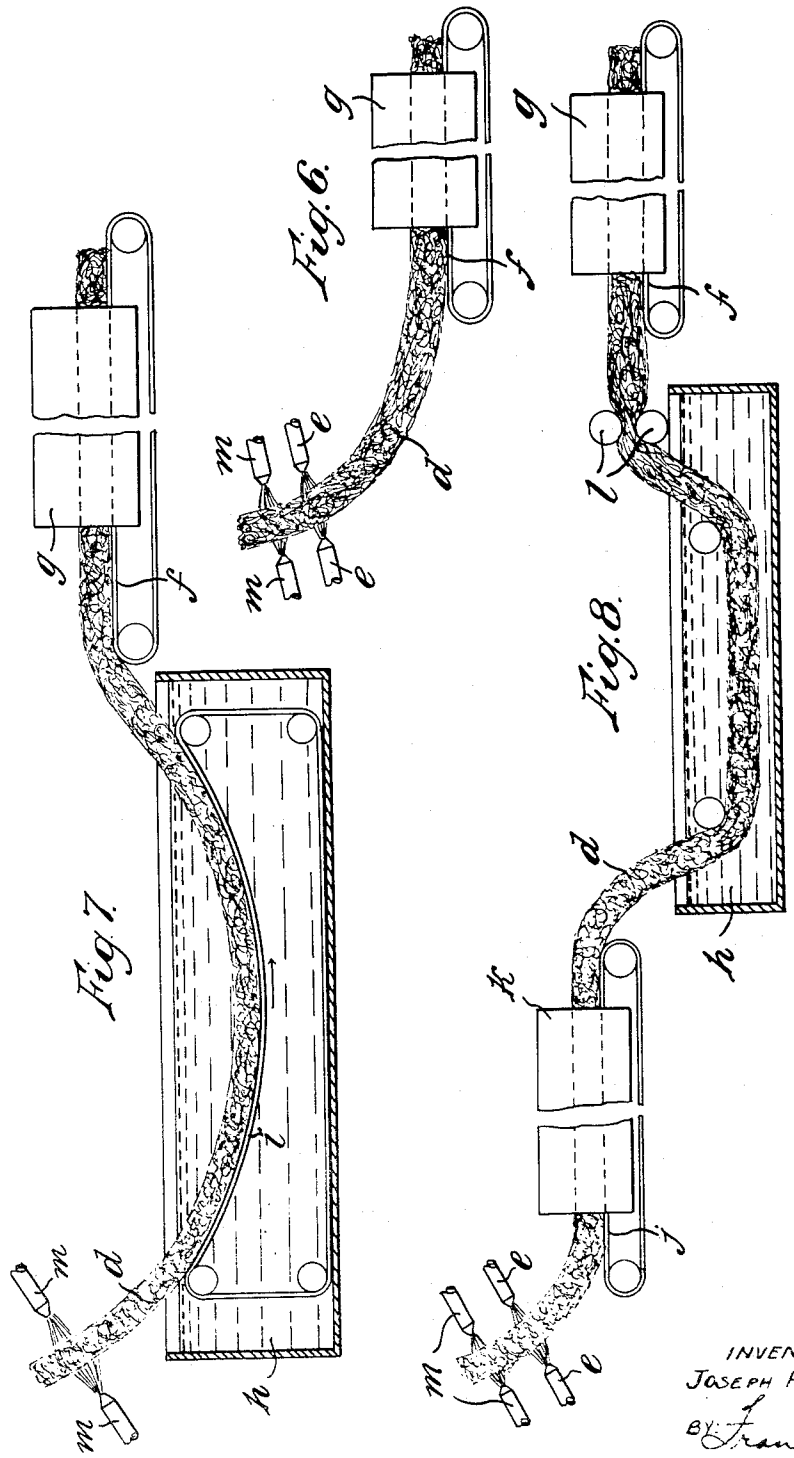
Fig. 5.

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MANUFACTURE OF UPHOLSTERY PADDING

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UNITED STATES PATENT OFFICE

2,003,935

MANUFACTURE OF UPHOLSTERY PADDING

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Application July 10, 1934, Serial No. 734,519
In Great Britain December 6, 1933

3 Claims. (Cl. 91—68)

This invention relates to the manufacture of upholstery padding of the kind which consists of a mass of upholstery fibres, such as horsehair, held together by an adhesive, such as rubber deposited thereon directly from rubber latex. This material is described in the production of shaped upholstery pads of fibres held together in a loosely associated, open condition, in the specification of United States Patent No. 1,906,028.

The object of the present invention is to provide a method of and a contrivance for manufacturing the above described material in lengths.

According to the invention, hair or other upholstery fibre is introduced between the upper ends of a downwardly extending stationary surface and another downwardly extending surface, in such quantities as to fill the intervening space and after issuing at the lower end of the space, the resulting web of hair or other fibre is treated with an adhesive, such as rubber deposited thereon from rubber latex, which may be vulcanized latex.

The web of hair or other fibre after being treated with adhesive is dried and if treated with rubber is, if necessary, also vulcanized. After or before drying or drying and vulcanizing, the web of hair or other fibre is cut into lengths to serve as upholstery pads.

Conveniently a hopper is provided over the space between the downwardly extending surfaces, which latter extend downwards substantially without convergence from the convergent surfaces of the hopper, into which the hair or other fibre is shaken or otherwise introduced.

The two downwardly extending surfaces constitute in effect a die determining the profiles of the corresponding surfaces of the issuing web. Accordingly, the surfaces may have appropriate profiles to produce from webs cut into suitable lengths, back or seat squabs for seats or other upholstery pads of variable cross-section.

As usual a profiled upholstery squab or cushion has a flat base or back, only one of the downwardly extending die surfaces is in such case profiled and the opposite surface is flat. The flat downwardly extending die surface may therefore be formed by a downwardly travelling belt, the downwardly extending profiled surface being stationary.

The hair or other fibre is introduced into the hopper in such quantities as to be in a more or less open expanded or loosely associated condition when passing between the die surfaces, and consequently the frictional resistance is insufficient to prevent the web of hair or other fibre descending by gravity, assisted or not by one of the surfaces being a downwardly travelling belt.

The hair or other fibre may be treated with a coagulant of rubber either before or after passing through the die, so that on being treated with latex the deposit of rubber is accelerated thus reducing liability of the structure of the web sagging under the weight of the latex.

Representative examples of methods and contrivances for carrying out the invention are illustrated, more or less diagrammatically, on the accompanying drawings, in which:—

Fig. 1 is a side elevation of a hopper die, and

Fig. 2 is a sectional plan thereof on the line 2—2 of Fig. 1.

Fig. 3 is a side elevation of a modified form of hopper die, and

Fig. 4 is a sectional plan thereof on the line 4—4 of Fig. 3.

Fig. 5 is a cross section of the resultant web on the line 5—5 of Figs. 1 and 3.

On a smaller scale:

Fig. 6 is a diagrammatic side elevation illustrating one method of treating the web.

Fig. 7 is a diagrammatic side elevation partly in section illustrating another method of treating the web.

Fig. 8 is a diagrammatic side elevation partly in section illustrating a further method of treating the web.

Referring more particularly to Figs. 1 and 2:

a, *b* are two downwardly extending plates mounted between cheek plates *c*, in which the plate *b* is adjustably secured by nuts b^2 on studs b^3 adjustable along slots c^1, so that the opposed surfaces of the plates *a*, *b* are maintained an adjustable distance apart without mutual convergence.

The plates *a*, *b* are extended upwards by divergent portions a^1, b^1 so as to provide a hopper above the space between the opposing surfaces of the plates *a*, *b*.

The opposed surface of the plate *b* has the profile of the upper surface of a seat squab, as shown in Fig. 2, whereas the opposed surface of the plate *a* is flat like the bottom of a seat squab.

Hair or other fibre is loosely shaken into the hopper a^1, b^1 to fill the space between the opposed surfaces of the plates *a*, *b* between which the mass of hair or other fibre descends by gravity to issue at the bottom as a web *d* of the cross section, Fig. 5, of a seat squab imparted thereto by the profiles of the opposed surfaces of the plates *a*, *b*.

To assist the descent of the mass of hair or other fibre, the flat plate *a* may be replaced by a downwardly travelling belt a^2, as shown in Figs. 3 and 4.

The web *d* may issue straight downwards or a laterally curved chute a^3 may be provided to divert it eventually to extend horizontally.

The web *d* of hair or other fibre on issuing from the above described die is wetted with rubber latex, whereby rubber becomes deposited on the individual fibres and interconnects them at their points of approximate contact. The latex-wetted web is eventually dried and, if necessary, vulcanized to fix the shape imparted to the web by the die.

As shown in Fig. 6 the wetting of the web *d* with latex can be effected by spraying the web with latex from nozzles *e* past which the web is led, on its way to a travelling belt *f* which carries it into and through a hot vulcanizer or drier *g*.

Alternatively to wetting the web *d* with latex by spraying, the web may be led through a bath *h* of latex. This is shown in Fig. 7 wherein the web *d* is supported on a slack travelling belt *i* during its passage through the bath *h*. On issuing from the bath, the latex-wetted web *d* passes to the hot vulcanizer or drier *g* on the belt *f*.

In a further alternative method, the web *d* is repeatedly wetted with latex to promote the deposit of an ample quantity of rubber on the fibres. If between successive wettings the web is dried or dried and vulcanized, the rubber already deposited on the fibres will impart sufficient resilience to the web to enable it to recover its shape after being squeezed to remove excess latex on subsequent wettings. Fig. 8 shows the web *d* being first wetted with latex sprayed from nozzles *e* and then dried by being conveyed on a travelling belt *j* through a drier or hot vulcanizer *k*. On issue from the drier *k* the web is then led through a bath *h* of latex, but as the web has now been strengthened by a dried initial coating of rubber on its fibres, no slack supporting belt, such as the belt *i* in Fig. 7, is provided. On issuing from the latex in the bath *h* the web is passed between mangle rolls *l* which squeeze out excess latex from the web. The web *d* then passes to the belt *f* which conveys it through the hot vulcanizer or drier *g*.

The necessary vulcanizing agents are mixed with the latex unless vulcanized latex is used.

To accelerate the deposit of rubber from the latex, preferably the fibres of the web *d*, before being wetted with the latex, whether by spraying or by passing through a bath, are pre-treated with a coagulant of rubber, either in liquid or powdered form. Suitable coagulants are, for instance, a solution of calcium nitrite in acetone or powdered slaked lime.

The coagulant may be applied to the hair or other fibre before it is introduced into the hopper die, or can be applied to the web *d* after issue from the die. For instance the coagulant can be sprayed in liquid or powdered form on to the web *d* from nozzles *m*, as indicated in Figs. 6, 7 and 8.

After the web *d* has been dried and, if required, vulcanized it can be cut up into suitable lengths to serve as upholstery squabs. Alternatively, as above mentioned, the web *d* may be cut into lengths after being dried but before being vulcanized, in which case the cut off squab lengths are conveyed to a vulcanizing chamber on trays.

As some of the hairs will arrange themselves fortuitously perpendicularly to the plane of the die plate *a* or belt a^1, and therefore will be end on to pressure applied to a seat or back squab formed therewith, straight hair instead of or as well as curled hair can be used.

Upholstery springs *n*, Figs. 1 and 2, may also be introduced into the die with their axes perpendicular to the plate *a* or belt a^1, so as to become embedded in the resultant web *d* to be in appropriate operative positions when the latter is cut up into seat squabs.

In the following claims the expressions "rubber" and "latex" are intended to include analogous hydrocarbons and aqueous dispersions thereof respectively.

I claim:—

1. A method of producing a web of upholstery fibres held together in a loosely associated condition by rubber deposited from rubber latex, consisting in introducing said fibres into the top of a downwardly extending confined space, wetting with latex the web of said fibres on issue from the bottom of said confined space, drying said latex-wetted web, immersing said dried web in latex, squeezing said web after said immersion, and drying said latex-wetted web after said squeezing.

2. A method of producing a web of upholstery fibres held together in a loosely associated condition by rubber deposited from rubber latex, consisting in introducing said fibres into the top of a downwardly extending confined space, wetting with latex the web of said fibres on issue from the bottom of said confined space, vulcanizing said latex-wetted web, immersing said vulcanizing web in latex, squeezing said web after said immersion, and drying said latex-wetted web after said squeezing.

3. A method of producing a web of upholstery fibres held together in a loosely associated condition by rubber deposited from rubber latex, consisting in introducing said fibres into the top of a downwardly extending confined space, wetting with latex the web of said fibres on issue from the bottom of said confined space, vulcanizing said latex-wetted web, immersing said vulcanizing web in latex, squeezing said web after said immersion, and vulcanizing said latex-wetted web after said squeezing.

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