

J. MacN. WILSON.
PROCESS FOR CLEANING CAR CUSHIONS.
APPLICATION FILED MAY 2, 1914.

1,243,473.

Patented Oct. 16, 1917.

2 SHEETS—SHEET 1.

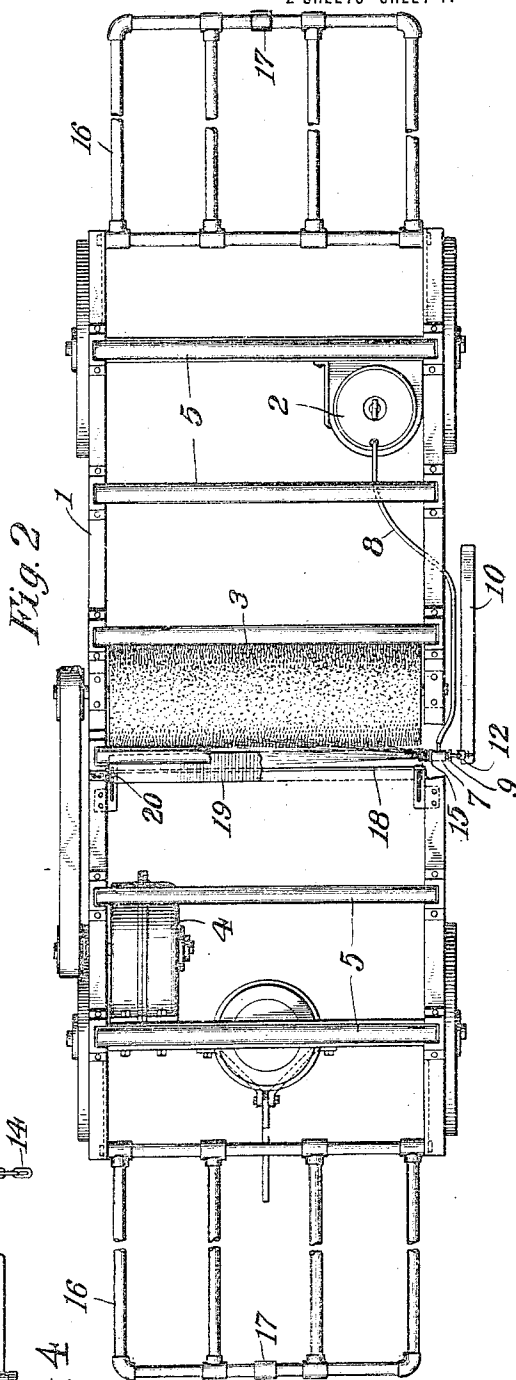
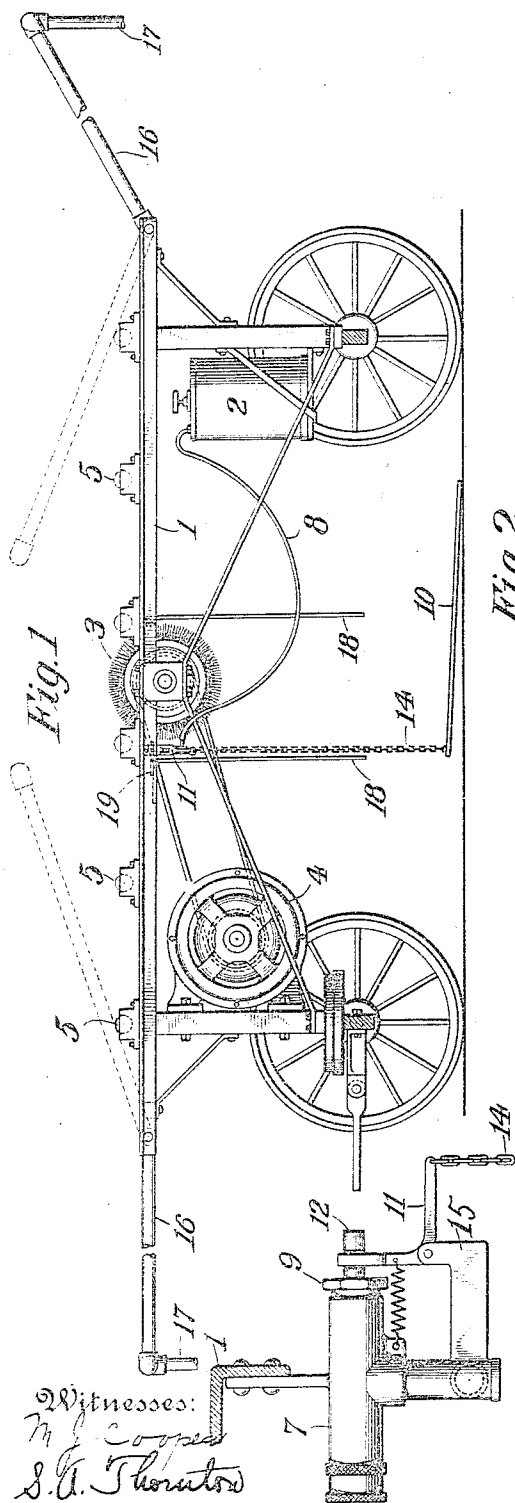


Fig. 4

Witnesses:
M. Cooper
S. A. Thornton

Inventor
John MacNall Wilson
By *Attorneys*
Messrs. Austin

J. MacN. WILSON.
 PROCESS FOR CLEANING CAR CUSHIONS.
 APPLICATION FILED MAY 2, 1914.

1,243,473.

Patented Oct. 16, 1917.

2 SHEETS—SHEET 2.

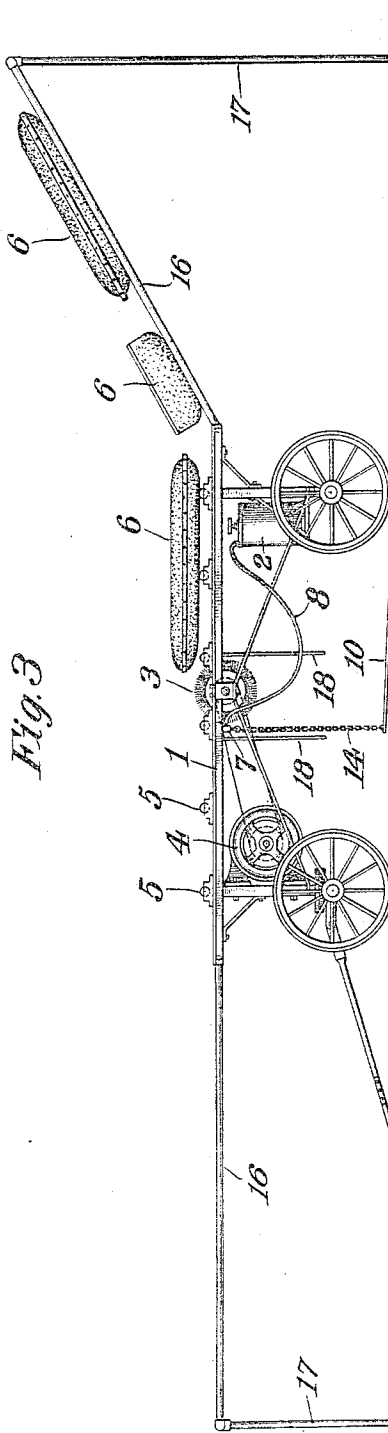


Fig. 3

Witnesses:
 M. J. Cooper
 S. P. Thornton

Inventor
 John MacNaul Wilson
 By Lin Ottorberg
 Attorney

UNITED STATES PATENT OFFICE.

JOHN MACNAULL WILSON, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO FRANKLIN MURPHY, OF NEWARK, NEW JERSEY.

PROCESS FOR CLEANING CAR-CUSHIONS.

1,243,473.

Specification of Letters Patent.

Patented Oct. 16, 1917.

Application filed May 2, 1914. Serial No. 835,832.

To all whom it may concern:

Be it known that I, JOHN MACNAULL WILSON, a citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Processes for Cleaning Car-Cushions, of which the following is a specification.

10 The invention relates to the cleaning and renovating of articles and fabrics of various kinds and particularly to a process for cleaning and renovating car cushions of plush, cane, or other material.

15 One of the objects of the invention is to cleanse the outer portion or surface of car seats or other articles with a suitable liquid by applying such liquid in a manner that will permit the cushion or article to be dried promptly and permit practically immediate use thereof.

20 Another object of the invention is to remove all dust, dirt and foreign substances from the article and simultaneously to utilize the air currents generated by the cleaning device for the purpose of applying a liquid to the article.

25 A further object of the invention is to apply a liquid in the form of a very fine spray and then remove the liquid from the article by a rubbing action which will cause the liquid to penetrate a suitable distance into the nap and at the same time dry the outer ends of the nap or the outer surface of the article.

30 The various other objects and advantages of the invention will be in part obvious and in part more fully set forth in the following description of my improved process, which consists in the steps and methods hereinafter set forth and claimed.

In the accompanying drawings:—

35 Figure 1 is a side elevation of one form of apparatus for carrying out my improved process.

Fig. 2 is a plan view of the same.

Fig. 3 is a view similar to Fig. 1 with the parts in operative position.

40 Fig. 4 is a detail view showing controlling means for the liquid outlet.

My improved process consists broadly in carrying the very finely divided particles of a suitable liquid into contact with the surface to be treated by means of vigorous air currents which are utilized to break up the liquid into extremely minute particles or vesicles.

55 Preferably the liquid is applied after a preliminary brushing or carding of the article to be treated which removes loose dirt and foreign matter and also straightens out the nap, and particularly the fine fibers thereof. The liquid when deposited by air currents as just described, forms a fine layer on the surface without particular penetration below the top of the nap, is allowed to remain thereon for a period depending on the nature of the liquid and the extent, if any, it is desired to start the dye in order to renew or brighten the article. The surface is then subjected to the action of a rapidly rotating brush which removes the deposited moisture or liquid, and at the same time brings the same momentarily into contact with the lower and intermediate portions of the nap, but without allowing the liquid to collect thereon or remain in contact therewith for an appreciable period. This operation may, if desired, be repeated a number of times provided a single application of the liquid is not sufficient to produce the desired results. The surface is then allowed to dry, which occurs in a very brief time, and the article is then ready for use.

60 The particular type of apparatus illustrated in the accompanying drawings adapted for carrying out my improved process, comprises a portable frame 1 having a receptacle 2 of any desired size for a suitable cleansing and renovating liquid of any well known or prepared ingredients. Mounted upon the frame is a rotatable brush 3 which is driven at a predetermined high speed by any suitable means as an electric motor 4. The brush projects above the top of the frame and slightly above the tops of anti-friction rollers 5 that provide means for carrying a car cushion 6 or other article into contact with the brush. A suitable nozzle 100

zle 7 is mounted on the frame that is in communication with the liquid receptacle by a suitable pipe or conduit 8. The orifice of the nozzle is spaced a short distance from the brush and has its axis inclined slightly toward the brush. The nozzle is so located that the liquid will be ejected opposite the upper half of the brush and in practice I have found that good results are obtained when the liquid is discharged in a horizontal plane intersecting the brush in a line about forty-five degrees from the vertical axis of the brush.

The passage through the nozzle is controlled by a valve 9 that is preferably operated by a foot pedal 10. The pedal is operatively connected to the valve by a bell crank lever 11 secured at one end to the stem 12 of the valve and connected at its other end to the pedal or foot lever by a suitable chain or other connection 14. The lever 11 may be supported in any suitable manner as by an arm or bracket 15 secured to or formed integral with an extension on the shell or casing of the nozzle.

If desired, the frame may be provided with a folding extension 16 at each end so that a number of cushions can be carried by the frame at a time. Said extensions are provided at their free ends with suitable supports 17 whereby they may be held in adjusted position. These extensions are of sufficient length to reach approximately to the level of a car window, thus permitting the cushions to be passed through the window onto one of the extensions and thence be carried to the frame or table of the machine.

Preferably two depending baffle plates 18 are arranged on opposite sides of the brush and project downward a suitable distance to intercept loose particles of dirt or dust and to determine to some extent the air currents generated by rotation of the brush. Adjacent to the brush on the side thereof next to the nozzle is mounted a horizontal shelf or plate 19 which may be formed integral with the baffle plate or separated therefrom as desired, and which is adjustable toward and away from the brush by any suitable means as adjusting screws 20. This shelf limits the upward sweep of the air current to a predetermined space adjacent the surface of the brush.

Under normal working conditions the brush is rotated at a relatively high speed and thus produces strong air currents having a whirling motion tending to follow the brush. The liquid is ejected from the nozzle in the form of a spray and owing to the slight inclination of the nozzle, approximately the same amount of liquid is delivered at all points on a line parallel with the axis of the brush. As the spray passes

beyond the edge of the shelf 19 it encounters the violent air current that rushes up between the baffle plate and the surface of the brush, and is divided into extremely fine particles or vesicles which are carried by the air current into intimate contact with the outer portion of the nap without penetrating to the base of the nap, as would be the case if a solid stream of liquid were employed. After the liquid has been applied, it is allowed to remain in contact with the nap for a short interval and then the cushion is passed in a reverse direction over the same brush. This causes the bottom and intermediate portions of the nap to be moistened momentarily by the liquid deposited on the surface, but owing to the high speed of rotation of the brush and the relatively slow movement of the cushion which is moved by hand the principal effect of the brush is a drying action.

The liquid may be applied to the cushion either before or after a preliminary treatment of the nap by the brush; depending on the condition of the cushion. In case the cushion is moved across the brush from the position shown in Fig. 3, the surface is first subjected to the scrubbing action of the brush which removes all dust, dirt and other foreign matter therefrom and as the brushed portion of the cushion passes out of contact with the brush, it immediately is subjected to the air current and receives a coating of the liquid which remains on the surface for a period varying from a few minutes to a considerable fraction of an hour, depending largely on the nature of the liquid that is used and its effect, if any, upon the dye of the cushion. During the initial or forward movement of the cushion, the nozzle valve is opened by the operative as he guides the cushion forward and past the brush. When the cushion is moved in the opposite direction, the spray is shut off and the moistened surface of the nap is subjected to the action of the brush which distributes any collected moisture and tends to dry the surface. This operation may be repeated as many times as necessary properly to cleanse the cushion. It is obvious, however, if the cushion is comparatively free from dust and foreign matter, or if a very brief contact of the liquid with the fabric is desired that the cushion may be caused to travel with instead of against the rotation of the brush, that is, in the opposite direction from that indicated by the arrow in Fig. 1, and, in such case, the liquid will be applied and almost immediately thereafter the moistened surface will come into contact with the brush. After the entire surface has been treated in this manner, the cushion may be passed over the brush in a contrary direction to the first movement,

that is, in the direction of the arrow, and subjected to the drying action of the brush, either with or without a further application of the liquid, as desired.

5 The penetration of the liquid into the nap of the cushion is determined by the quantity of liquid forced through the nozzle in a given time, mainly by the character of the air currents generated by rotation of the
10 brush. These air currents are controlled to an extent by the adjustable horizontal baffle plate which limits the passage for the air and determines the effect of the air current upon the liquid. The liquid is already
15 in the form of a mist or spray as it is ejected from the nozzle and as it comes into contact with the vigorous air current that sweeps up through the space between the baffle plate and the brush, the spray is further sub-
20 divided into extremely fine particles or vesicles which are deposited by the air current on the surface without penetrating to any appreciable or considerable depth. The air current also produces an especially even dis-
25 tribution of the liquid over the surface of the cushion, owing to the fact that the current expends itself in a pocket or recess formed by the contact between the curved surface of the brush and the approximately
30 flat surface of the cushion which is supported by the rollers. The quantity of liquid forced from the nozzle is controlled by the valve opening and by the pressure from the liquid in the reservoir, but in practice, this
35 latter factor remains practically constant and the flow is regulated almost entirely by the valve.

The limited amount of liquid supplied, the rapid brushing by a rotatable brush
40 provided with flexible bristles, together with the strong air currents, causes the cushion to dry very promptly so that it can be put back in use in a comparatively short time. Consequently, in the case of railway coaches,
45 the cushions can be removed from the car, be thoroughly cleaned, renovated and dried without taking the car from the terminal or interfering with the regular schedules.

It will be obvious that brushes having dif-
50 ferent kinds of bristles may be used if desired in connection with various kinds of fabrics or to increase or decrease the scrubbing action on the fabric. It will be obvious also that various changes and modifi-
55 cations may be made in the details of the process and that various changes, substitutions and omissions may be made in the particular apparatus for using the process that is shown and described without departing
60 from the spirit of the invention, provided the means set forth in the following claims be employed.

I claim as my invention:—

1. The process of cleaning and renovating

65 fabrics which consists in sub-dividing a cleaning liquid into minute particles by an air-current and causing said current to deposit the finely divided particles on the sur-
70 face of the fabric to be cleaned in the form of an extremely attenuated coating or film, and then rapidly brushing said surface to remove the film before it has penetrated through the fabric.

2. The process of cleaning and renovating a fabric, provided with a body portion and
75 a nap, which consists in sub-dividing a cleaning liquid into minute particles by an air-current and causing said current to deposit the finely divided particles on the surface
80 of the nap in the form of a coating or film, and then removing said fabric without permitting the same to penetrate below the lower portions of the nap.

3. The process of cleaning and renovating which consists in producing an air current
85 approximately normal to the surface of the article to be cleaned, forcing a liquid spray into said air current in a direction approximately parallel to the surface of the article and approximately normal to said air cur-
90 rent, causing the air current to carry a portion of said liquid against the surface, and then removing said liquid and drying the surface.

4. The process of cleaning and renovating
95 which consists in subjecting the cleaning liquid in the form of a spray to the action of an air current to subdivide the same into minute particles, causing said current to carry such particles into contact with the
100 surface of the article to be treated, then subjecting the surface of the article to a rapid brushing action to interrupt the surface penetrating action of the liquid.

5. The process of cleaning and renovating
105 a fabric having a nap which consists in subjecting a cleaning liquid in the form of a spray to the action of air currents to subdivide the same into minute particles, causing
110 said air currents to carry such particles into contact with the outer portion of the nap, then bringing a portion of such deposited liquid momentarily into contact with the bottom and intermediate portions of the
115 nap, and then removing said liquid.

6. The process of cleaning which consists in producing air currents, forcing a liquid
in the form of a spray into said air currents and causing the current to deposit the
120 liquid on the outer surface of the article to be cleaned, then subjecting the article to the brushing action which is produced by flexible bristles moving at a high rate of speed.

7. The process of cleaning car cushions
125 which consists in carding the cushion to straighten the nap thereon, directing a current of air against the carded portion of the cushion, forcing a cleaning liquid in the

form of a spray into said air current and causing the same to be deposited on the outer surface of the cushion without appreciable penetration below the top of the nap, 5 then subjecting said cushion to a rubbing action to moisten momentarily the intermediate portion of the nap and simultaneously dry said cushion.

Signed at New York in the county of New York and State of New York this 28th day 10 of April, A. D. 1914.

JOHN MACNAULL WILSON.

Witnesses:

M. J. COOPER,
S. A. THORNTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

It is hereby certified that in Letters Patent No. 1,243,473, granted October 16, 1917, upon the application of John MacNaull Wilson, of Montclair, New Jersey, for an improvement in "Processes for Cleaning Car-Cushions," an error appears requiring correction as follows: In the grant, line 1 of the granting clause, for "John MacNaull Wilson and Franklin Murphy, their" read *Franklin Murphy, his*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of July, A. D., 1918.

[SEAL.]

W. H. CLAY,

Acting Commissioner of Patents.