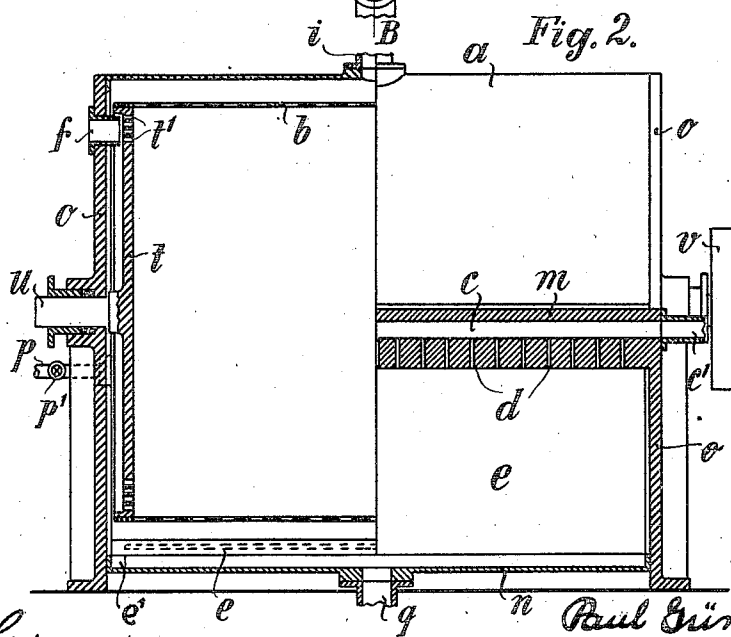
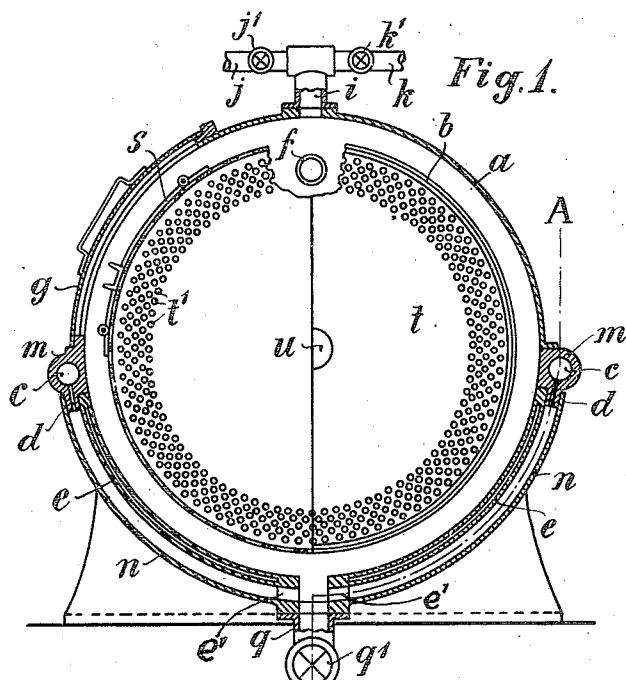


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 WASHING AND CLEANING MACHINE FOR TEXTILE FABRICS AND THE LIKE.
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971,745.

Patented Oct. 4, 1910.



Witnesses:-

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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PAUL GÜNGERICH, a subject of the Emperor of Germany, and a resident of Gera, Reuss, Germany, have invented certain new and useful Improvements in Washing and Cleaning Machines for Textile Fabrics and the Like, of which the following is a full, clear, and exact specification.

10 This invention relates to a machine for washing and cleaning textile fabrics and the like, in which the volatile cleaning medium, for instance benzin, evaporates after the cleaning and is condensed in a condenser
15 and the principle object of this invention is to provide a device for effectually cleaning said fabrics and for a perfect recovery of the cleaning medium.

The invention consists in the construction
20 of an apparatus in which the inert gas, used for the recovery of the cleaning medium, for instance, carbonic acid gas or a mixture of the same with air, is led through channels which are arranged lengthwise in the casing of the machine surrounding heating
25 compartments arranged between the casing and the inner drum, said channels connecting the heating compartments with the channel for the admission of the mixture of gas, the evaporated medium being finally
30 drawn through the perforated side-walls of the inside drum and also through an orifice and pipe which is provided on the upper rim of one of the side-walls of the casing.

35 In the drawing an apparatus for carrying out this process is shown as an example.

Figure 1 is in part a vertical cross section through the casing and the inner drum, and in part a vertical section through the casing only. Fig. 2 is in part a longitudinal
40 vertical section through the casing and the inner drum, and in part a section on line A—B of Fig. 2.

The upper half of the casing which with
45 its lower half is firmly secured to a suitable foundation consists of a mantle *a* of sheet metal, which is provided with a door *g* and in its highest point with an orifice and pipe stem *i*. From the latter branch off two
50 pipes *j* and *k* which may be controlled by valves *j'* and *k'*. The mantle *a* is supported by two ribs *m*, which run along the entire width of the machine and have a longitudinal bore or channel *c* for the reception of
55 connecting stems *c'*.

The outer lower part of the casing is formed by a mantle of sheet metal *n*, opposite which are arranged two parallel plates spaced apart forming heating compartments
60 *e*. To these compartments *e* are connected tubes *p* adapted to be controlled by valves *p'*. The insides of the compartments *e* are curved in such a way that they form so to say a continuation of the upper mantle *a*.
65 The upper ends of the compartments *e* fit tightly against the ribs *m* and their lower ends rest with supports *e'* upon the mantle *n*. To the lower end of the latter is connected a tube *q* controlled by a valve *q'*. From
70 the channels *c* bores *d* equally distributed over the whole width of the machine, lead into the space between mantle *n* and the heating compartments *e*. The side-wall *o* as shown in Fig. 2 is provided with an out-
75 let *f*.

The end walls *t* of the inner drum *b*, which is made of perforated sheet metal and has two doors *s*, are provided with holes *t'* the greater number of which are located
80 near its edge. The end walls *t* carry shafts *u* passing through the walls *o* of the casing and extending loosely through the same and a tight closure is obtained by means of collars and glands. One of the shafts *u* bears
85 a pulley *v* (Fig. 2).

The machine operates as follows: The materials to be cleaned are placed in the inner drum *b* through the open doors *g*, *s*; the latter are then closed. Benzin, gasoline, or the like is then brought through the
90 pipe *q*, from below into the machine during which operation the valve *j'* in the tube *j* making connection with the atmosphere is kept open. After the benzin has entered the pipe stem *i*, and has driven out all air
95 from the interior of the machine the valve *j'* is closed and the valve *k'* in tube *k* is opened which stands in communication with a reservoir (not shown) filled with carbonic acid gas or any other inert gaseous medium.
100 Now one part, perhaps one-third of the benzin is pumped out of the machine through pipe *q* during which operation the valve *k'* remains open. Then the valve *q'* is closed and the inner drum is turned slowly in the
105 customary way now in one and then in the other direction, so that the textiles or the like are thoroughly cleansed by the benzin. The cleaning effect may be increased by opening the valve *p'* and introducing hot
110

steam into the compartments *e* from a steam generator (not shown) connected to the tube *p*. After the benzin has absorbed the dirt contained in the material it may be removed
 5 and be replaced by clean benzin, after the inner drum has been stopped. After the clean benzin has been introduced said inner drum is again allowed to rotate for some time now in one and then in the other direc-
 10 tion. When the cleaning is finished the inner drum is stopped and the pipe *q* is connected with a benzin reservoir (not shown) into which the polluted benzin from the machine is allowed to run. Thereupon the
 15 inner drum is caused to rotate with high speed in one direction only, so that the benzin still remaining in the material is centrifuged out, and is removed through the tube *q*. In order to remove even the
 20 last particles of benzin that may still be contained in the fabric, the inner drum is finally slowly rotated in different directions and the carbonic acid gas which is contained in the machine and in the tubing is brought
 25 into circulation by a pump (not shown). The pump forces the carbonic acid gas or its substitute through the bores *d* into the space between the mantle *n* and the heating compartment *e* along the lower side of which
 30 it rises in order to reach the inner drum *b*. From here the carbonic acid gas makes its way through the drum *b* filled with the material to be cleaned and then through the holes *t'* into the end walls *t* and the outlet *f*
 35 of the outside wall *o* which is connected with a condenser (not shown). By passing over the heating compartments *e* the carbonic acid gas and also the interior of the machine is strongly heated, so that all of the
 40 benzin yet remaining in the material evap-

orates and escapes together with the carbonic acid gas into the condenser, where it is condensed and separated, while the carbonic acid gas again flows to the machine to receive more of the benzin vapors. After a
 45 certain time also the last remainder of benzin is forced out of the material and the machine after closure of the valve *p'* is stopped and opened for the removal of the cleaned material.
 50

Having thus described my invention what I claim is:

A machine of the character described comprising an outer stationary drum composed of an upper mantle and a lower mantle,
 55 means connecting both mantles, and an inner rotatable drum, both drums having openings for the introduction of the material to be cleaned, means to close said openings,
 60 means to rotate the inner drum, heating compartments at the lower part of the stationary outer drum formed by two parallel plates spaced apart from each other, a channel formed by said plates and the outer wall
 65 of said drum, openings connecting channels formed in the connecting means for the upper and lower mantles of the stationary drum with the channel formed by said plates for the distribution of carbonic acid gas and
 70 the means for admitting a heating medium to the heating compartments, thereby heating the carbonic acid gas and the cleaning medium substantially as described and for the purpose set forth.

In testimony whereof I affix my signature
 75 in presence of two witnesses.

PAUL GÜNGERICH.

Witnesses:

OTTMAR MEISTER,
 PAUL WUNDERLICH.