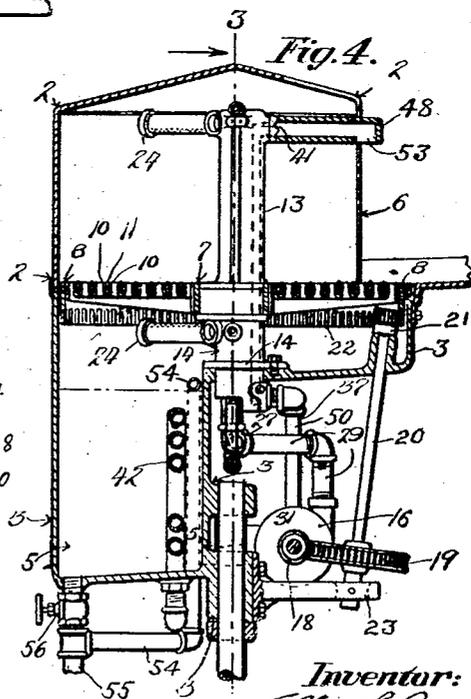
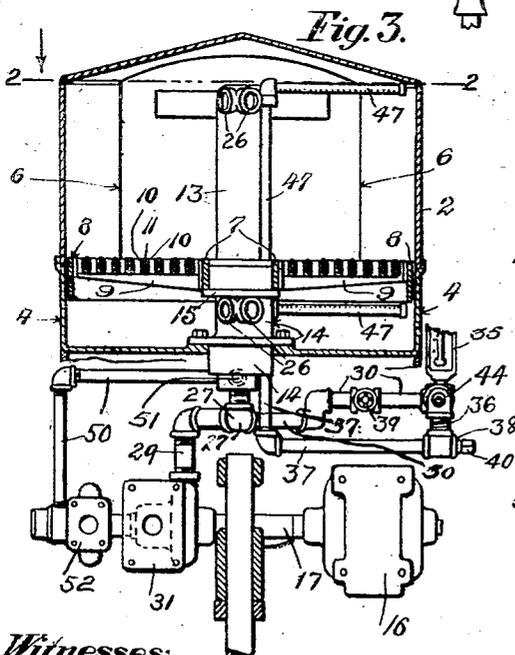
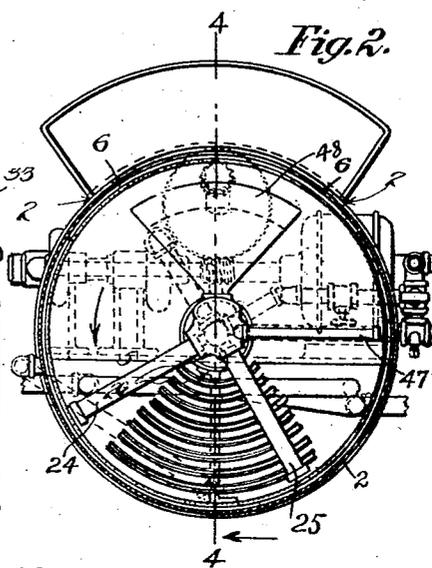
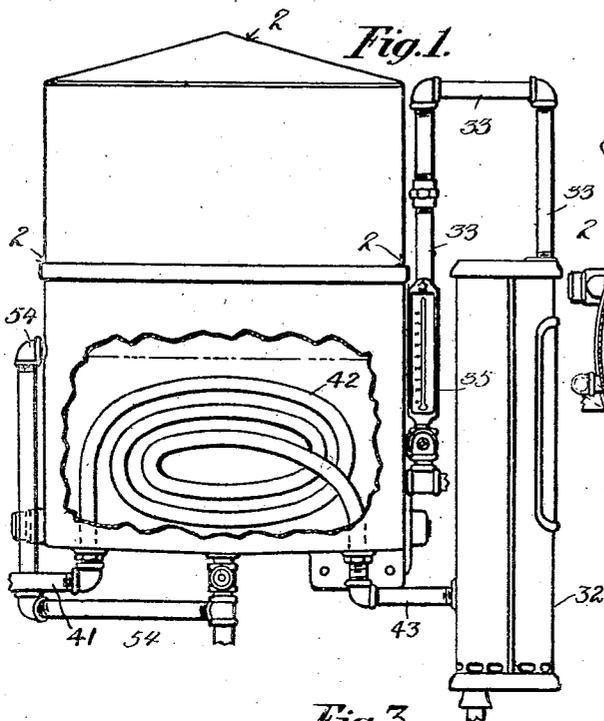


E. L. COUCH.
 WASHING MACHINE.
 APPLICATION FILED FEB. 7, 1916.

1,332,712.

Patented Mar. 2, 1920.

2 SHEETS—SHEET 1,



Witnesses:

J. H. Elliott
 Bessie Rumba

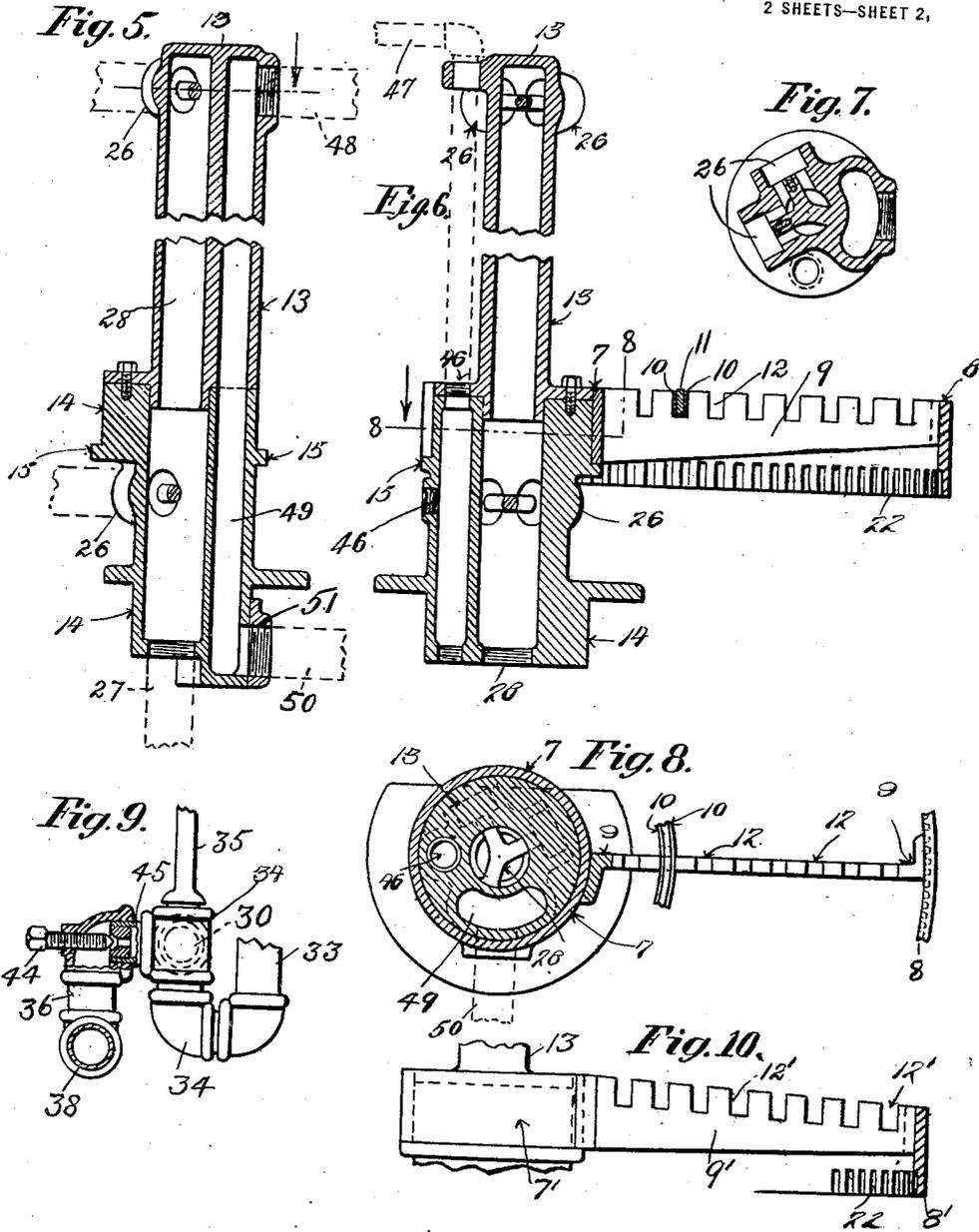
Inventor:

E. L. Couch
 by John H. Joy
 his attorney

E. L. COUCH.
 WASHING MACHINE.
 APPLICATION FILED FEB. 7, 1916.

1,332,712.

Patented Mar. 2, 1920.
 2 SHEETS—SHEET 2.



Witnesses:

J. H. Elliott

Boyer Parker

Inventor:

E. L. Couch

J. H. Elliott
 Attorney

UNITED STATES PATENT OFFICE.

ELBERT L. COUCH, OF HARTFORD, CONNECTICUT, ASSIGNOR TO COLT'S PATENT FIRE ARMS MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

WASHING-MACHINE.

1,332,712.

Specification of Letters Patent.

Patented Mar. 2, 1920.

Application filed February 7, 1916. Serial No. 76,879.

To all whom it may concern:

Be it known that I, ELBERT L. COUCH, a citizen of the United States, residing at 564 New Britain avenue, Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

This invention relates to what I shall for convenience term a "washing machine." I have selected this title primarily for the reason that the machine is of especial utility when used in the connection noted. Some of the features may be used with equal advantage in other connections. While as may be inferred, the machine when organized for washing can be used for cleansing articles of any suitable nature, especially, however, those such as tumblers, cups and equivalent receptacles. Among the objects of the invention are the provision of a machine of the nature set forth which is compact and which will effectually and thoroughly clean articles. Another object is the provision of means by which water is positively maintained at approximately a predetermined temperature. When the machine is used for washing, the water or other liquid will be hot or virtually so, and in this event I insure that the water be at the desired high temperature sufficient to thoroughly clean. The apparatus involves other features of novelty and advantage, which with the foregoing will be stated at length in the following description wherein I will set forth in detail that form of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification, this to enable those skilled in the art to practice the invention. As will be apparent I do not limit myself to this disclosure; I may depart therefrom in several respects within the scope of the invention defined by the claims following said description.

Referring to said drawings:

Figure 1 is a rear elevation of a washing machine involving the invention, a part of the tank being removed to show a heat-regulating element.

Fig. 2 is a horizontal section on the line 2-2 of Fig. 3, looking in the direction of the arrow.

Fig. 3 is a vertical section on the line

3-3 of Fig. 4, looking in the direction of the arrow.

Fig. 4 is a vertical section on the line 4-4 of Fig. 2.

Fig. 5 is a vertical transverse section looking toward the rear of a combined standard and conduit.

Fig. 6 is a similar view of said combined standard and conduit, the section, however, being taken at right angles from that of Fig. 5 and showing also a part of the carrier.

Fig. 7 is a horizontal section of said combined standard and conduit, the section being taken just below the article carrier.

Fig. 8 is a horizontal section on the line 8-8 of Fig. 6.

Fig. 9 is a sectional detail of a regulating valve and certain adjunctive parts.

Fig. 10 is a detail view in sectional elevation of a portion of said duct and standard and carrier, and illustrates a modification.

Like characters refer to like parts throughout the several views, which it will be seen are on different scales.

Some of the operative parts including the carrier for the articles to be washed are preferably inclosed in a suitable casing or housing. The casing or housing for such purpose is denoted in a general way by 2 (Figs. 1 to 4 inclusive). As illustrated said casing comprises a tank or receptacle as 3 from which rises the washing chamber 2, the tank 3 in turn having the pendant portion or vat 5 containing washing solution diluted with water. The washing chamber 2 as shown has in its front an opening 6 through which the parts to be cleaned are introduced and through which they may be removed after the cleansing operation.

In the casing or housing is mounted a suitable carrier for the articles. This carrier in the present instance is movable, being preferably rotative. As shown it comprises a hub 7, a rim or band 8 and spokes 9 radiating from the hub and connected to the rim internally thereof, the three parts generally but not necessarily being formed integral. As illustrated the upper surfaces of the hub or ring 7, the band or rim 8 and the spokes or arms 9 are in the same horizontal plane. The hub, rim and the spokes constitute the body of the carrier. The operative or article-carrying portion of the

carrier may as illustrated be made up of several horizontally alined, concentric annular members 10 of channeled form in cross section and packing material as 11 packed comparatively closely in the grooves of the respective annular members which are preferably seated in suitably spaced notches or slots 12 (Fig. 6) in the upper sides of the spokes or arms 9. This packing material is ordinarily of some comparatively soft material such as fiber or vulcanized rubber, merely two of several illustrations. In view of this circumstance it will be clear that the active part of the article carrier is yielding or soft so as to avoid the possibility of breaking fragile or comparatively delicate articles put upon it. The channeled annular elements 10 constitute suitable cases or jackets for the circular packing members 11. As will be clear these annular elements 10 are of progressively increasing diameter commencing with the innermost one, and in practice they are spaced at approximately equal intervals and a distance sufficient to prevent articles falling through the spaces but not enough to interfere with the proper and free passage of the wash material whatever it may be. These circular packing or projecting members 11 may be related in any desirable manner. They may be of progressively-increasing heights commencing with the innermost one so that as a consequence the soft article supporting portion of the carrier is inclined upwardly and outwardly from the innermost packing or projecting member. As a matter of fact the carrier is of skeleton or open work construction, being adapted to properly support the articles to be washed but not to prevent the access to and escape of washing water therefrom. At the same time any sediment or other foreign matter that may have passed from the articles during the act of washing or otherwise can pass through these spaces or intervals between said annular members. While it is of advantage owing to cheapness of production to make the operative portion of the carrier of a series of concentric spaced rings, this is not essential, because the open work feature can be secured in other ways.

The rotary article carrier may be supported in any desirable manner, the standard or column 13 being shown for this purpose, said standard or column in addition to sustaining the support also acting as a duct as will hereinafter more particularly appear. This standard or column 13 as shown best in Fig. 3 extends through the high or upper portion of the tank 3. It might be noted in passing that the article carrier rotates in said high or upper portion. This standard or column 13 in the present case is fixed or stationary. As illustrated it has near its lower end a flange 14

attached by screws or otherwise to the high portion of the tank. It has in addition to the attaching flange 14 the flange 15 on which the hub 7 is supported and turns.

The article carrier may be rotated in any desirable manner, the electric motor 16 presenting a suitable means of effecting through the aid of convenient parts, the desired action. The armature shaft 17 of the motor is shown having fastened thereto a worm 18 in mesh with the worm gear 19 rotative with the shaft 20 which as illustrated stands at a slight angle to the vertical. This, however, is a detail. This shaft has attached to it a suitable power transferring element such as the bevel gear 21 adapted to mesh with a gear or circular rack 22 inside the rim or band 8 of the article carrier. A toothed gear inclosed by the band is desirable but not essential; it has an advantage owing to the positive drive obtained while compactness is insured by inclosing the driving element whether it be in the form of a toothed gear or otherwise in the band. This shaft 20 is shown supported at its lower end by a bearing 23 projecting from the bottom part of the tank 3, the upper part of the shaft extending through the upper portion of the tank 3. It will be clear that if the motor 16 be in operation, the article carrier through the described parts will be rotated.

As the article carrier rotates the articles thereon are subjected to a washing action, for instance by means of water projected from below and above the articles, which when of cup type are placed inverted or upside down on the carrier. By directing streams oppositely against the articles when in such relation they are adequately cleaned interiorly and exteriorly, the streams preferably being directed against the articles upward from below the carrier and downward from above the same, the cleansing water as already observed and the refuse matter passing through the openings of the carrier and into the tank 3. I have shown above and below the carrier two wash water pipes 24 and 25 of practically duplicate construction, the under side of the upper pipe and the upper side of the lower pipe having a multiplicity of perforations to direct separate streams of water from opposite directions against the articles. In addition to the wash water pipes 24 there are two other wash water pipes as 25 arranged in the same relation to each other as the wash water pipes 24, the pipes 25 being spaced a suitable distance from the preliminary or initial water pipes or ducts. These four wash water pipes as shown are tapped at their inner ends into bosses as 26 projecting from the standard or column 13 at superposed points, that is to say there are two of these bosses 26 below the article carrier and some-

what adjacent thereto, while there are two other similar bosses above and as shown a greater distance from the carrier. The wash water pipes extend radially from said standard or column 13, their outer ends being capped or closed and being situated in proximity to the body of shell portion 2 of the housing. Tapped or otherwise suitably fitted into the lower end of the standard or upright 13 is a coupling member such as the T 27 for the supply of water to the passage 28 extending longitudinally of said column, the bosses 26 to which I have already referred opening into this passage 28 from which as will be evident, the several wash water pipes 24 and 25 are in communication with said passage. The part 13, therefore, presents a combined column and duct. To one branch of the T 27 the pipe 29 is connected, the pipe 30 being connected with the other branch of said T. The pipe 29 extends from the pump 31 driven in the present case by the shaft 17. While the pipe 29 extends from the discharge side of said pump 31, the inlet side thereof (Fig. 2) is connected with the vat 5 near the bottom thereof as also shown in Fig. 4. It will be clear, therefore, that when the pump 31 is in action, it will draw water from the vat 5 and by way of the discharge pipe 29 convey the same into the T 27, the water passing from these into the passage 28 and out the several wash water pipes 24 and 25.

I have mentioned the fact that the articles are primarily subjected to the action of washing water. This washing water is directed against the articles in rather large volume, issuing from the two sets of pipes 24 and 25. In addition to this initial treatment of the articles, they are given a final spray. The preliminary water and the spray water, as I have considered it, is hot, but as a matter of preference to secure the most desirable results, the final spray is hotter than the preliminary washing water. This will receive further discussion hereinafter. To effect the heating of the water I provide a suitable heater, the gas heater 32 (Fig. 1) being shown for this purpose. This gas heater is of familiar type and requires no detailed description. The discharge pipe from the heater 32 is designated by 33 and as represented it terminates in a T 34 (Fig. 9) from one branch of which the thermometer 35 rises, the thermometer subserving its usual function of indicating the temperature of the feed water passing from the heater into the tank 3. With the thermometer-carrying branch of the T 34 is connected the coupling 36 (Figs. 3 and 9). From this coupling the pipe 30 already described leads. Also connected with the coupling is a pipe 37, the purpose of the pipe 37 being, as will be hereinafter described, to conduct sprinkling water to

sprinkler members. Also connected with the nipple 36 is a pipe 38. In the pipe 30 is a valve 39.

Under normal conditions the heater 32 supplies hot water to the final spray pipes 47 by way of the pipe 37, and after the water has served its function of rinsing the articles on the article carrier, it flows back into the vat 5 by way of the tank 3. The heater 32 can also supply hot water in case the motor does not operate from any cause, the hot water entering the pipes 30 and 37 and thus passing into the column 13, and from the passage 28 thereof into the sprinkler pipes 24 and 25 respectively, thereby making at all times the use of the apparatus serviceable.

The initial supply of water for washing purposes can come from a main or otherwise by way of the pipe 41 (Fig. 1) which as shown extends through the bottom of the depressed portion or vat 5 and is connected to a suitable element as the coil 42 within said depressed portion or vat. The discharge end of the coil 42 extends through the bottom of the depressed portion or vat 5 and is connected as by the pipe 43 with the inlet of the heater 32. The coil 42 as shown is below the normal level of the water in the vat 5 which is indicated by dotted lines in Figs. 1 and 4. The passage of the final spray water along the pipe 37 is regulated, and an important advantage follows this regulation. The office in question can be obtained in any desirable way, the needle valve 44 as shown best in Fig. 9 being shown for this purpose, the valve being tapped through the coupling 36 already described and its cone-pointed end being coöperative with a seat at the outer end of the short pipe connection 45 uniting said coupling 36 and T 34. Ordinarily the temperature of the heater is constant, and this condition can be easily secured. The pipe 37 is tapped into the lower end of the column or duct 13 and is in communication with the longitudinal passage 46 of said column-duct. Tapped into said part 13 and extending radially therefrom are spray pipes 47 closed at their outer ends as are the wash water pipes 24. The pipes 47 are in horizontal line with the respective upper and lower wash water pipes, and like the latter are provided with a multiplicity of perforations or small holes for jetting hot water against the articles. While the wash water is warm, it is not in the present case directly received from the heater 32. The sprinkling or rinsing water, however, which emerges from the pipes 47 is received practically directly from the heater and is, therefore, at a considerably higher temperature than the washing water.

There is naturally some steam with the sprinkling water, and I provide means for preventing the escape of this steam from the casing or housing 2, the collector 48 being

provided for this purpose. This collector 48 is of practically fan or segmental shape (Figs. 2 and 4) of hollow construction its small end being fitted into the upper end of the column 13 (Fig. 4) and being in communication with the passage 49 (Fig. 8) extending longitudinally of said column, the pipe 50 being connected with the port 51 (Fig. 3) at the lower end of said passage 49 and being also connected with an exhaust or suction device as 52 (Fig. 3) which disposes of the steam received from the collector 48 in any desirable way. This fan shaped collector 48 extends from the opening 6, being closed at its front end and having an inlet 53 (Fig. 4) in the under side near the rear end thereof. It will be assumed that the apparatus is entirely free of water and that it is desired to use the same for washing articles. In this event water at a low temperature or virtually cold is supplied to the coil 42 in the manner already described and is conducted by way of the pipe 43 to the heater 32 where it is heated up to the requisite temperature. The water is then delivered into the vat 5 in the manner also set forth, until it is at about the desired level which I have indicated by dotted lines in Figs. 1 and 4 as already noted. On the action of the motor 16 the pump 31 will be operated to effect the elevation of the water and its supply to the wash water pipes 24 and 25 and at the same time sprinkling or rinsing water issues from the sprinkler heads 47. It will be clear that the pump 31 is constantly in action so as to maintain the washing water in circulation. The sprinkling water is not actually circulated in the sense that the washing water is. After the water is at the requisite temperature which is obtained through the setting of the valve 44, the machine is in readiness for washing articles which are passed through the opening 6 and placed upside down on the soft rings 11. The direction of rotation of the article carrier is indicated by the arrow in Fig. 2. As the said carrier rotates, the articles are first washed by water issuing from the pipes 24. They are then further washed by water issuing from the pipes 25 and are finally sprinkled or rinsed by the hotter water passing from the pipes 47, one circuit of an article being generally all that is required to thoroughly wash it.

The overflow or waste pipe 54 may lead from the tank 5 and may be connected to the waste pipe 55 which is shown provided with a valve 56 between said overflow pipe and the vat. By opening this valve 56 the

vat 5 may be discharged of its contents by way of the pipe 55 which may for example be connected with a sewer.

As will be understood from what I have hereinbefore stated, I do not restrict myself to the particular construction shown and described in detail, which is merely one of the many forms of the apparatus, the definite showing being made to conform to the statute and enable those skilled in the art to practice the invention. In Fig. 10 I have shown a modification. In this view the column 13 is exactly like that already described. It supports an article carrier comprising the hub 7', rim 8' and spokes 9'. In this particular organization the upper surfaces of the spokes are on an incline or slant receiving channeled packing carriers as already described in the notches 12'. The soft parts of the operative portion of the carrier will, of course, be on a pitch corresponding with that of the spokes.

What I claim is:

1. A machine of the class described comprising a column, a rotary article carrier supported by the column, the column having a passage, means for supplying liquid to the passage, means for discharging the washing liquid from the passage and onto the articles on said carrier, and a steam collector connected with the column, the column having a passage to receive the steam from the collector.

2. A machine of the class described comprising a column, a rotary article carrier supported by the column, the column having two separate passages, means for supplying washing liquid to one of the passages, means for discharging the washing liquid from its passage and onto the articles on the carrier, and a fan-shaped collector in communication at its reduced end with the other passage, the front end of the collector being closed and the bottom having a steam inlet.

3. An article carrier comprising a hub, a rim, spokes connecting the hub and the rim, the spokes being notched in their upper edges, channeled pieces of annular form set in the notches of the respective spokes, and packing material in the channeled pieces constituting the supporting surface of the carrier.

In testimony whereof I have affixed my signature in presence of two witnesses.

ELBERT L. COUCH.

Witnesses:

LAWRENCE A. HOWARD,
BESSIE ROURKE.