

Jan. 13, 1931.

E. COWLES

1,789,272

METHOD OF PREVENTING TANGLING

Filed Oct. 14, 1927

2 Sheets-Sheet 1

Fig. 1.

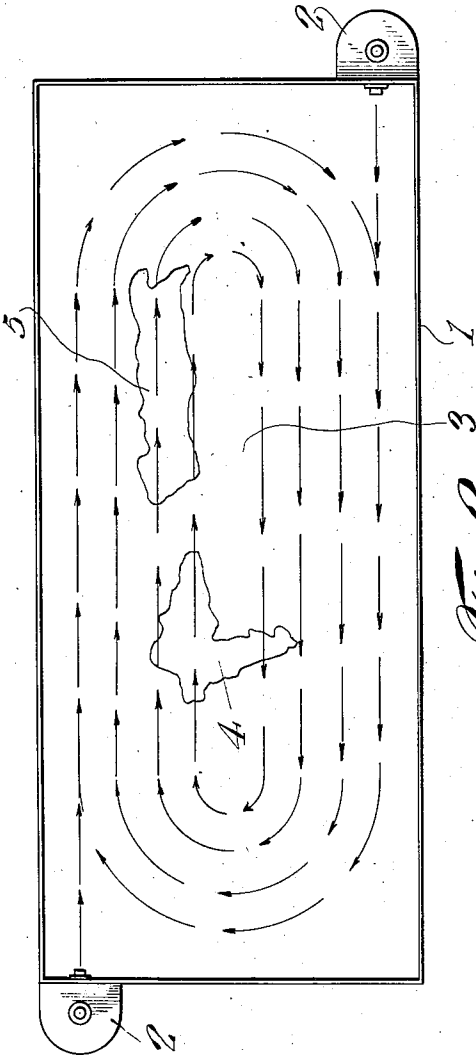
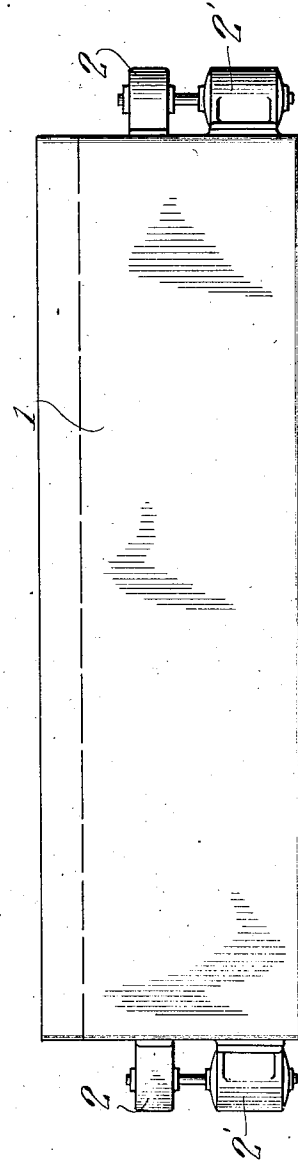


Fig. 2.



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Fig. 3.

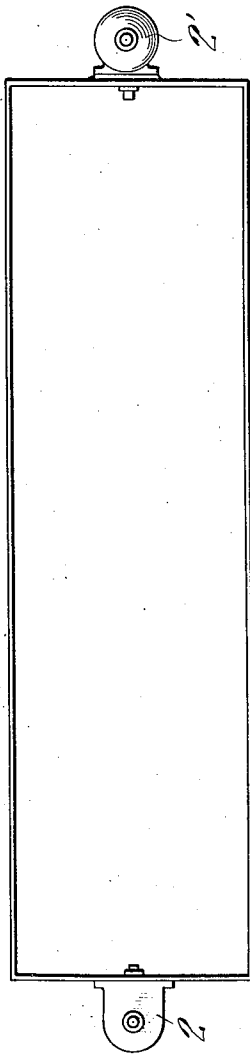
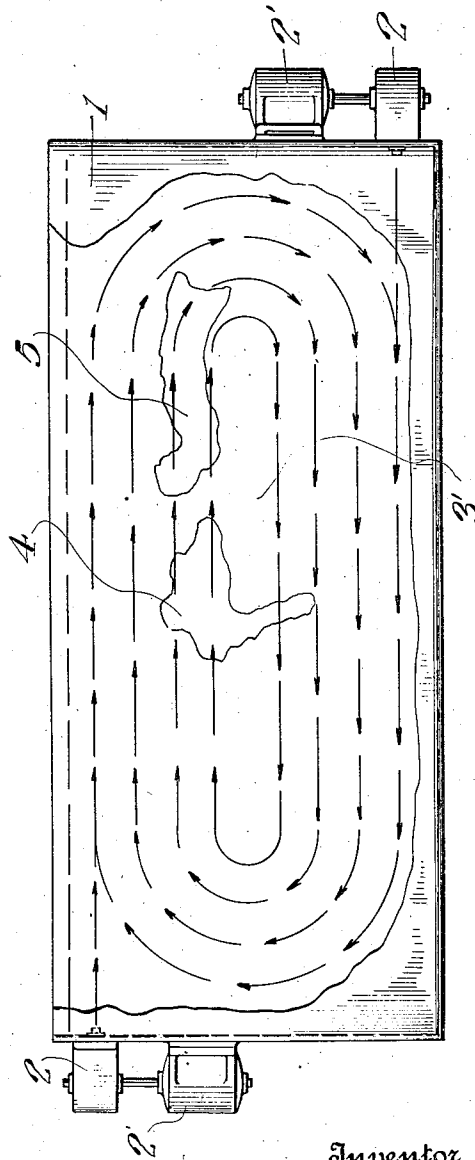


Fig. 4.



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UNITED STATES PATENT OFFICE

EDWIN COWLES, OF SHORT HILLS, NEW JERSEY, ASSIGNOR TO COWLES ENGINEERING CORPORATION, OF SEWAREN, NEW JERSEY, A CORPORATION OF NEW JERSEY

METHOD OF PREVENTING TANGLING

Application filed October 14, 1927. Serial No. 226,094.

This invention relates to methods of agitating liquids in which are suspended fabrics or other solid bodies or articles which are susceptible of tangling while in suspension.

5 In my previous Patent No. 1,545,082 issued July 7, 1925, I have described and claimed a method of agitating in which a jet of liquid is introduced into a chamber at relatively high velocity in order to cause the liquid and
10 the fabrics suspended therein to circulate about the chamber, and in order to cause circulation of the liquid about and through all parts of the fabrics held in suspension.

Such mechanisms as are illustrated in the
15 aforementioned patent may be employed to secure agitation herein, although, as will appear hereinafter, this invention is not limited to the use of such means but is applicable to other means in which a jet of liquid is employed to secure agitation. Means such as
20 disclosed in the said patent are preferably employed, however, in order to prevent the fabrics from matting against the openings through which liquid is withdrawn from the
25 chamber to the pump.

I have discovered that in cases where a jet of liquid is used to secure agitation in a tub or chamber which is substantially square or round in shape, and in which the fabrics in
30 suspension circulate about a central point as an axis, a tendency is sometimes observed for the fabrics to roll up into a wad or ball in such manner that eventually the separate pieces become tangled and snarled together.
35 When this condition develops the fabrics do not circulate properly and the washing action does not proceed as rapidly as would otherwise be the case, for the liquid fails to circulate through the fabrics in the interior of the
40 wad.

In order to overcome this difficulty, I propose to cause the liquid to circulate in the container in such manner that at some place therein an area will be provided in which the
45 liquid is substantially stationary, and in

which the liquid on either side of said area is caused to move in opposite directions along substantially parallel lines.

When circulated in this manner it is found that parts of the fabrics project into the stationary area and even across the stationary
50 area into the liquid which is moving in the opposite direction with the result that there is a constant tendency to pull the separate pieces apart instead of to roll them together.
55

A preferred embodiment of apparatus suitable for accomplishing this result is shown in the accompanying drawings, in which,

Figure 1 is a top plan view, with arrows to indicate the approximate path of the liquid.
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Figure 2 is a side elevation.

Figure 3 is a top plan view of a modified form, and

Figure 4 is a side elevation of the form shown in Figure 3.
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Referring to the drawings, the tub or container 1 is preferably of elongated rectangular shape for by using such shape I am able to effectively secure the desired results in a very simple manner as will appear hereinafter. The liquid jet or jets (two being
70 illustrated herein) may be introduced into the tub in any desired manner, but are preferably introduced at the ends of the tub and in a direction parallel to the long sides
75 of the tub. In the preferred embodiment illustrated pump casings 2 are secured directly to the exterior of the tub and the pumping mechanism therein (which may be similar to the disclosure of the said patent)
80 may be driven by any suitable source of power, as for example, an electric motor 2'.

The liquid in the tub circulates about the tub in the general direction indicated by the arrows, thus forming an area 3 in the center
85 of the tub where the liquid is substantially stationary. On one side of this stationary area the liquid is moving in one direction while on the other side of the said area the liquid is moving in an opposite direction,
90

the result being that whenever the fabrics in suspension move into or across the stationary area, the motion of the liquid tends to stretch out the separate pieces of fabric thus separating them and preventing tangling. In order to illustrate the nature of the action, there is shown in Figure 1 a piece of fabric 4, part of which has moved across the stationary area, so that one end of the piece is suspended in liquid moving in one direction, while the other end of the piece is suspended in liquid moving in an opposite direction. As a result of the pull in opposite directions the piece will eventually be drawn out to a shape similar to the piece 5. As will be apparent, if two or more pieces are tangled together when inserted in the tub the action just described will eventually separate them and cause them to circulate separately.

This separating or untangling action is aided also by the fact that the liquid along the outer sides of the tub is moving more rapidly than the liquid in the interior of the tub. This difference in speed results in a tendency to stretch out or pull apart fabrics which may be wadded or tangled, so that the individual pieces may circulate separately.

Figures 3 and 4 illustrate a modified form of the apparatus in which the tub, instead of being wide and relatively shallow as in Figures 1 and 2, is narrow and deep. In this form the liquid circulates in a vertical plane and a stationary area 3' is formed which serves to assist in untangling the pieces of fabric in the manner previously described.

It will be understood that the invention may be variously modified and embodied within the scope of the subjoined claims.

I claim as my invention:

1. The method of preventing tangling of solids while suspended in liquid which comprises directing a submerged jet of liquid in a container in a direction substantially parallel to the surface of the liquid in such manner as to cause the solids and liquid to circulate in an elongated path such that a substantially stationary area is provided along which the liquid moves in opposite directions.

2. The method of preventing tangling of solids while suspended in liquid which comprises causing the said solids and liquid to circulate within an elongated container by means of a submerged jet of liquid directed substantially parallel to one side thereof and substantially parallel to the surface of the liquid whereby the liquid and solids on one side of the container have translatory motion with respect to the liquid and solids on the opposite side of the container.

3. The method of preventing tangling of solids while suspended in liquid which com-

prises directing a submerged jet of liquid in a container in a direction substantially parallel to at least three sides of the container in such manner as to cause the solids and liquid to circulate in an elongated path such that a substantially stationary area is provided along which the liquid moves in opposite directions.

In testimony whereof I have signed my name to this specification this tenth day of October, 1927.

EDWIN COWLES.