

R. SMITH.
 AGITATOR OR MIXING APPARATUS.
 APPLICATION FILED MAR. 5, 1909.

946,281.

Patented Jan. 11, 1910.

Fig. 1.

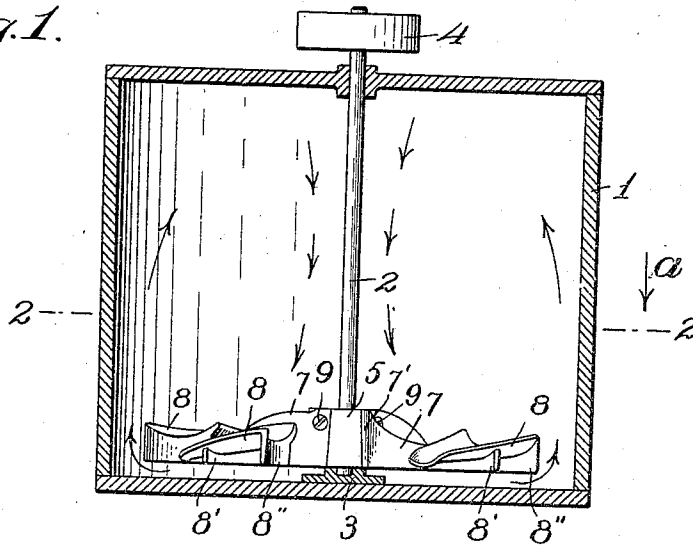


Fig. 2.

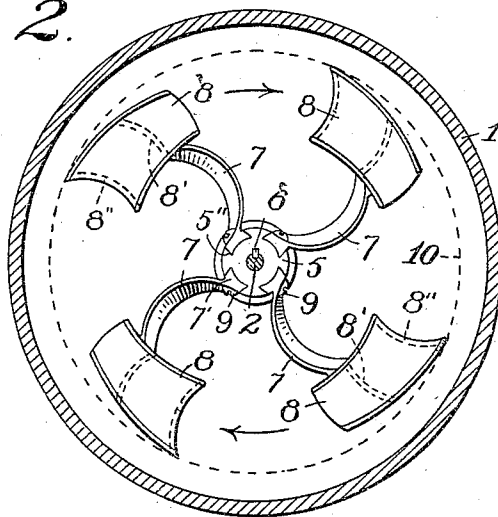


Fig. 3.

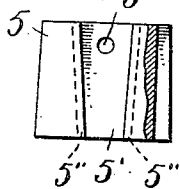
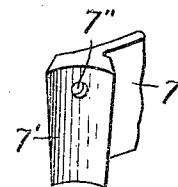


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD SMITH, OF BELLOWS FALLS, VERMONT.

AGITATOR OR MIXING APPARATUS.

946,281.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed March 5, 1909. Serial No. 481,389.

To all whom it may concern:

Be it known that I, RICHARD SMITH, a citizen of the Dominion of Canada, residing at Bellows Falls, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Agitators for Mixing Apparatus, of which the following is a specification.

My invention relates to an agitator or mixing apparatus, for mixing semi-liquid material, such as paint, pulp, etc., and particularly to that class of agitators or mixing apparatus shown and described in my U. S. Letters Patent, No. 865,128.

The object of my invention is to improve upon the construction of the agitator, used in the mixing apparatus, and my invention consists in certain novel features of construction of my improvements, as will be hereinafter fully described.

Heretofore it has been customary to make the agitator with a continuous outer rim or surface, having downwardly extending vertical flanges on the underside thereof. I have found in practice that very good results are obtained in mixing semi-liquid material, as paint, pulp, etc., by making the agitator with a disconnected outer rim, preferably in the form of separate blades, or plates, carried on separate arms, which arms are of propeller shape, and preferably removably attached to a central hub.

In my improved construction of the agitator, I have a central hub, which is secured on an upright driven shaft, to revolve with said shaft within the stuff chest, and I have a plurality of supporting arms, preferably four in number, each of which is of propeller shape, and preferably detachably secured at its inner end to the central hub by means of a vertically extending groove or recess in the outer surface of the hub, preferably of slightly tapering or wedge-shape, with the wider end at the upper side of the hub, and with undercut edges, to receive the attaching end of the arm, which end corresponds in shape to the recess in the hub, and is adapted to be inserted in said recess from the upper side thereof, and is preferably secured therein by a screw, or other device. The arm for holding the agitator blade or plate, is of propeller shape, that is of slightly curved or bow-shape, and slightly inclined and has secured to its outer end, or made integral therewith, a blade or plate, which extends in a substantially horizontal

plane, and at right angles to the supporting arm, and is slightly inclined upwardly and outwardly, and tangent to a circle having the hub as an axis. The top surface of said blade or plate is slightly grooved or hollowed in the direction of its length, with its front edge curved or bent slightly downwardly, like a scoop. Upon the lower side of the plate or blade are preferably two downwardly and vertically extending lips or flanges, extending transversely on the blade or plate, and one of said lips or flanges may be the extension of the supporting arm, at the front part of the blade or plate, and the other may be a separate lip or flange, extending down from the rear end of the blade or plate, all as will be hereinafter fully described.

Referring to the drawing:—Figure 1 is a central vertical section through a stuff chest, and a side or edge view of my improved agitator, and the upright shaft on which it is secured, and the driving pulley on the upper end of said shaft. Fig. 2 is a horizontal section, on line 2, 2, Fig. 1, looking in the direction of arrow *a*, same figure; the circular broken lines indicate a circle, with the hub of the agitator as an axis. Fig. 3 shows, on an enlarged scale, a side or edge view of the hub, with the groove or recess therein, and, Fig. 4 shows, on an enlarged scale, the inner attaching end of a supporting arm, which end fits into the recess in the hub shown in Fig. 3.

In the accompanying drawing, 1 is a portion of a circular stuff chest of any ordinary construction, which holds the material to be mixed.

2 is an upright shaft which is suitably supported at its lower end in a step or bearing block 3, and 4 is a belt pulley fast on said shaft 2.

My improved agitator which has a disconnected rim, comprises a hub 5, which is secured upon the lower end of the shaft 2 to revolve therewith, in this instance by a key 6, see Fig. 2. The hub 5 is provided, in this instance, with vertically extending grooves or recesses 5' in its outer surface, in this instance four in number. Each vertically extending groove or recess 5' is preferably made tapering toward the lower end of the hub, and has undercut ways 5'' therein, and also a threaded opening 5''' near the upper end of the recess 5', see Fig. 3. In this instance there are four supporting

arms 7, and four mixing blades or plates 8, forming the disconnected rim. Each supporting arm 7 has its attaching end 7', preferably of a shape corresponding to the shape of the groove or recess 5' in the hub 5, with its wider portion at the upper end, and is adapted to be inserted into the upper end of a recess 5', and move down therein, to extend at its upper and lower edge in the same plane with the upper and lower edge of the hub 5. A screw 9 is preferably used to secure the end 7' of the supporting arm 7 in the recess 5' in the hub 5; said screw 9 passes loosely through an opening 7'' in the end 7', and turns in the threaded hole 5''' in the hub 5.

The supporting arm 7 is preferably made of slightly bowed or curved shape, and slightly inclined, like a propeller blade and has secured upon its outer end, or made integral therewith, a blade or plate 8. The blade or plate 8 is slightly inclined upwardly and outwardly, and has its outer rear edge in a plane tangent to the circle, shown by broken lines 10, in Fig. 2, with the hub 5 as an axis. The upper surface of the blade or plate 8 is grooved or recessed slightly in the direction of its length, as shown in Fig. 4, and the edge at its front end is bent down slightly, as a scoop. The front end extends within the circle indicated by the broken lines 10, while the rear end is made slightly wider with its outer edge in the circle indicated by broken lines 10'.

Upon the lower or underside of the blade or plate 8 are preferably two downwardly extending flanges or projections, one 8', which is an extension of the supporting arm 7, and the other a separate flange or projection 8'', on the rear end of the blade 8, see Fig. 1. The flanges 8' and 8'' extend transversely on the plate 8. The four blades or plates form in this instance the disconnected rim of the agitator.

From the above description in connection with the drawing, the operation of my improvements in an agitator will be readily understood by those skilled in the art.

My agitator has a plurality of supporting arms extending out from the hub, and each arm carries a blade or plate. I prefer to use four supporting arms, and four blades or plates, but only two, or more than two arms and blades may be used, if desired. In transportation, and before the parts are assembled, the supporting arms and blades are separate, and unattached to the hub. In assembling the parts, the attaching end of each supporting arm is preferably fitted into a groove or recess in the hub, and then a screw or other device inserted to secure the same.

In connection with my improved agitator I may use an auxiliary propeller attached to the upper part of the shaft, as shown in

my patent above referred to, No. 865,128. As the upright shaft 2 is rotated by a belt passing around the pulley 4, the propeller on the upper part of said shaft, in case said propeller is used, will be rotated with said shaft, and my improved agitator on the lower end of said shaft will also be rotated, and the material in the stuff chest 1 will pass down from the upper part of the chest at the center part thereof to the lower part, at the central portion, and between the propeller shaped arms 7, and then up at the outer part of the chest, as indicated by arrows in Fig. 1. The propeller shaped arms 7, and the blades or plates 8 thereon act to draw down the material and cause it to circulate from the top to the bottom of the stuff chest, as above described, and also act to lift up the material from the bottom part of the chest, and by reason of the tangent position of the blades or plates 8 to throw outwardly the material toward the walls of the chest, thereby producing a cross current, and causing a more thorough agitating and mixing of the material.

It will be understood that the details of construction of my improvements may be varied if desired, and two or more supporting arms, each carrying a blade or plate, may be used, and instead of attaching the detachable arms to the central hub in the particular way shown in the drawing, and above described, they may be attached in any other suitable way.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. An agitator, for a mixing apparatus, comprising a hub with a plurality of propeller shaped arms, the outer end of each arm having thereon a blade or plate of concaved scoop shape, and the front end of each blade inclined downwardly, and the rear end upwardly and outwardly.

2. An agitator for a mixing apparatus, comprising a hub with a plurality of propeller shaped arms, the outer end of each arm having thereon a blade or plate of concaved scoop shape, and the front end of each blade inclined downwardly, and the rear end upwardly and outwardly, and a downwardly extending flange or projection on the underside of the blade.

3. An agitator for a mixing apparatus, comprising a hub with a plurality of propeller shaped arms, the outer end of each arm having thereon a blade or plate of concaved scoop shape, and the front end of each blade inclined downwardly, and the rear end upwardly and outwardly, with the outer edge tangential to the circle having the hub for an axis.

4. An agitator for a mixing apparatus, comprising a hub having vertically extending grooves or recesses in its outer surface

with undercut edges, supporting arms having ends to fit into said grooves or recesses and detachably secured therein, and a blade or plate on each arm, said blade or plate inclined upwardly and outwardly.

5 5. An agitator for a mixing apparatus, comprising a hub having vertically extending grooves or recesses in its outer surface with undercut edges, supporting arms having
10 ing ends to fit into said grooves or recesses

and detachably secured therein, and a blade or plate on each arm, said blade or plate inclined upwardly and outwardly, and recessed or grooved longitudinally, and having one or more downwardly extending
15 flanges or projections on its lower side.

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Witnesses:

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