Oct. 24, 1950 H. E. GILLIAM 2,526,863

MIXING PADDLE FOR PAINTS, ETC

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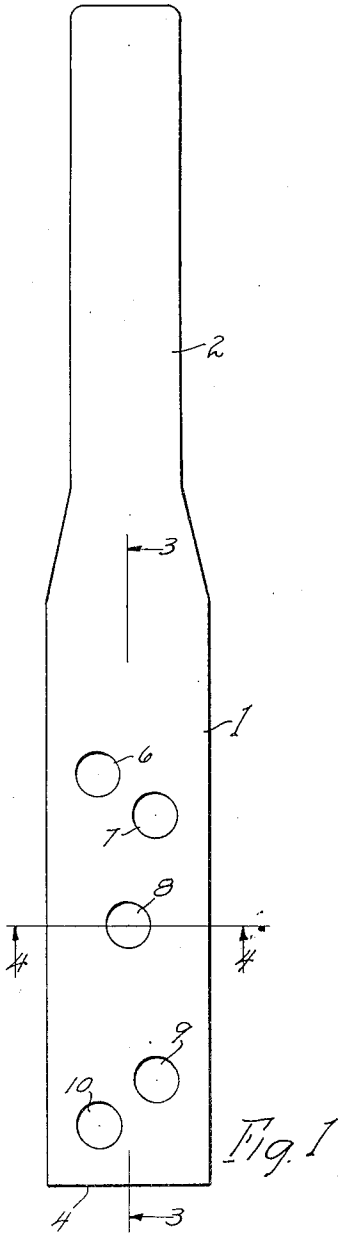


Fig. 1

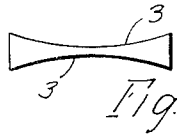


Fig. 2

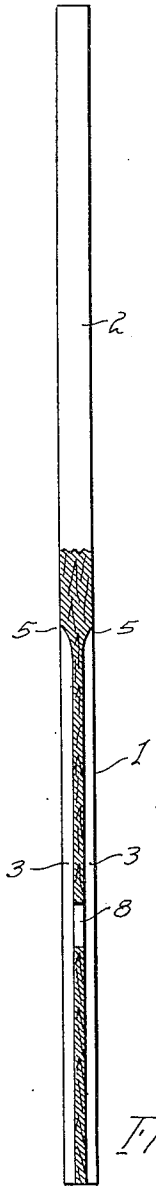


Fig. 3

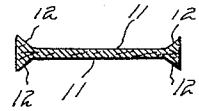


Fig. 5

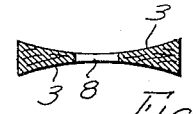


Fig. 4

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MIXING PADDLE FOR PAINT, ETC.

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1 Claim. (Cl. 259—144)

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This invention relates to devices for stirring and mixing paint and other liquids.

While the invention is applicable to various uses in the various arts, perhaps its most important use is as a device for stirring paint to mix the oil or other liquid vehicle with the pigment; and for thoroughly mixing different colors of paint in making a color blend; and will be described herein as applied to that use.

Paint as sold, for example in cans, consists of unmixed oil or like vehicle and pigment or other solid matter, the latter being in the bottom of the can in a compact semi-liquid layer. The contents of the can must be thoroughly mixed together on the job to make good paint, and it is common practice to use for the purpose a paddle like tool. To mix a gallon can of paint with a simple paddle takes considerable time and effort; and unless immediately used, the solid matter will settle out again and will again have to be mixed. Unless the user exercises enough care and patience, and thoroughness, the paint will not be thoroughly mixed and the painted-on coat will be inferior. Like care and thoroughness must be used in mixing colors of paint to make a color blend.

Various improvements have been proposed in the construction of mixing paddles to make thorough paint mixing easier and quicker.

It is known that liquid and solid matter or two liquids of different specific gravity can be mutually incorporated or homogenized by forcing them through holes; and among such prior proposals for paint mixing paddles has been to make a paddle with holes in it; but such a paddle has not made material improvement because there is no provision to force the material through the holes, and it tends to flow laterally around the side edges of the paddle instead of going through the holes; and there is no provision to raise or lift the heavy material upwardly from the bottom so that it is merely stirred around horizontally with a swirling movement at the bottom of the can.

According to the present invention, a paddle is provided having a working blade, and holes are provided extending through the blade, and distributed along the blade longitudinally; and the face of the paddle blade is formed so that as it is moved through the fluid and semi-fluid contents of a paint can, the contents are forced inwardly toward the middle of the paddle blade and concurrently upwardly longitudinally along the center of the paddle blade and thereby constrained or forced to flow through the holes; and the contents are concurrently caused to circulate from the lower end of the paddle blade upwardly

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along the blade and then downwardly laterally of the paddle, with a vertically circulating movement.

The combined dual action of forced vertical circulation and propulsion of the contents of the can from the bottom upwardly along the blade, and through the holes, effects by actual timed testing, a more rapid and thorough mixing of the contents than is possible with any prior device of which I have knowledge; and the mixed contents after standing separate again more slowly than when mixed by prior devices and therefore require less time to again thoroughly mix them.

It is among the objects of the invention:

To provide generally an improved mixing paddle of the class referred to;

To provide a mixing paddle having an improved mode of operation;

To provide a mixing paddle having a blade formed so that when propelled through material to be mixed the material will be forced upwardly longitudinally thereover and flow with a vertically circulating movement;

To provide a mixing paddle having the properties referred to in the preceding paragraph and provided with holes through the blade and means to constrain the material to flow through the holes.

The invention itself is set forth in the accompanying claim.

An illustrative embodiment of the invention is set forth in the following description taken in connection with the accompanying drawing in which:

Fig. 1 is a front elevational view of a mixing paddle embodying the invention in one form;

Fig. 2 is a lower end elevational view of the paddle of Fig. 1;

Fig. 3 is an interrupted longitudinal sectional view taken from the plane 3—3 of Fig. 1;

Fig. 4 is a cross sectional view taken from the plane 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 4 showing a modification.

The particular embodiment of the invention chosen for illustration and description herein, comprises, as shown in Figs. 1 and 2, a one piece paddle comprising a blade 1 and handle 2, the actual size thereof being identified by the scale of the drawing which is made approximately two-thirds full size for a paddle suitable to mix or homogenize paint in a commercial one gallon can.

The paddle is preferably made from a strip of wood (although other materials may be used) of uniform thickness, although the thickness of the handle may be different from that of the

blade if desired. The blade 1 constitutes generally the lower half of the paddle.

The opposite faces of the blade 1 are hollowed out or made concave as shown at 3—3, from the lower end 4 to approximately the upper end of the blade 1 as at 5—5, although these concavities can if desired be continued into or throughout the length of the handle 2 is desired.

The blade 1 has a number of holes 6 to 10 inclusive, extending therethrough, and they are circular for the convenience of forming them by drilling, but they may have other shapes if desired. Five holes are shown spaced apart longitudinally along the blade in transversely staggered relation.

Some of the advantages of the invention, as will be explained, may be had without any holes in the blade, although all of the advantages are had when holes are provided; and when holes are provided their exact size, number, and distribution, or pattern arrangement is not essential to the invention.

However, the full advantages resulting from the utilization of holes results when holes are provided in the lower, upper, and intermediate parts of the blade.

The concavities 3—3 are shown in both faces of the blade, and this is preferred although some of the advantages derived from these concavities will be had with a concavity 3 in only one face of the blade, as will be explained.

The concavities 3—3 are illustrated as substantially circular transversely, or cylindrical longitudinally, but they may have other forms as shown for one possible other form as a modification in Fig. 5, where the concavities comprise substantially planar portions 11—11 at the middle of the blade and beveled portions 12—12 at the sides of the blade.

The operation of the device is as follows:

The paddle is grasped by the handle and the blade is projected downwardly into the contents of the paint can to the bottom of the can, and the faces of the blade are propelled by hand back and forth, keeping the blade substantially vertically or as nearly so as is convenient.

As the blade thus sweeps through the can contents, the blade, being thicker at its edges than at its middle because of the concavities on the faces, causes the contents to be propelled toward the middle of the blade; and this produces some fluid pressure thereat. The only relief for this pressure is upwardly. The fluid contents accordingly are caused to flow upwardly along the blade. A forced circulation of the liquid and semi-liquid solid matter is thus set up in vertical directions, upwardly along the blade faces and downwardly at the side edges of the blade, which rapidly mixes them.

Also, the said pressure on the face of the blade causes some of the contents flowing thereover to be forced through the blade holes which additionally acts to mix and homogenize the contents.

The blade thus performs a dual mixing action; and when the face concavities as shown and described are provided at both faces, this action occurs in both directions of propulsion of the blade.

The shortening of the time to thoroughly mix a gallon can of paint by a paddle of this construction can only be appreciated by timed and controlled tests, which have been made as follows:

A "control test" was made using a paddle of

the outside dimensions of that of Fig. 1 but without concave faces and without holes. It was propelled back and forth at a timed rate and with a measured stroke, and on a preselected path, in a fresh can of paint as sold commercially with the solid matter in the bottom. The operation was stopped when on inspection the contents became mixed barely sufficiently well to use as paint. The time was fourteen minutes of mixing.

A first test paddle was made constructed like the one of Fig. 1 having concave faces, but without holes, and operated under identically the same conditions as those of the "control test." The mixing time was ten minutes.

A second test paddle was made constructed like the one of Fig. 1, that is with concave faces and also holes, and was operated under the identical "control test" conditions. The time was seven and one-half minutes.

These tests are tabulated below for convenient comparison.

	Minutes
Control test; simple flat faced paddle	14
First test; paddle of Fig. 1; concave faces, no holes	10
Second test; paddle of Fig. 1; concave faces, and holes	7½

From the foregoing, it is seen that a part of the improvement in time reduction is due to the concave faces; and part due to the holes when combined with the concave faces.

The maximum saving of time in the second test, in the absolute sense, is six and one-half minutes per gallon, and is approximately a 50% saving of time. This in itself is a well worthwhile improvement; but an equally important improvement resides in the greater insurance that the paint will be thoroughly mixed before using. The shorter the time it takes the operator to thoroughly mix the paint, the more certain he is to keep on working it until it is thoroughly mixed and the less liable he is to run out of patience and persistence and begin to use the paint before it has been sufficiently mixed.

Incidentally, it was found on the above tests that while the paint appeared, upon examination, to be mixed to the same degree of completeness on all of the tests, the solid matter of the paint mixed by the control test settled out on the bottom of the can after standing for a measured period of time, more than it did for either of the other two tests; so that considerable time was saved by the paddles of the other two tests when the paint was re-mixed for use after standing, showing that there was a greater degree of homogenization on these two tests.

The concavities 3—3 in the faces, produce relatively sharp side corners on the lower end of the blade. The operator can manipulate the paddle to use these corners to scour out the last remnants of the solid matter in bottom corner of the can and incorporate them into the mixture.

For cans of paint of smaller size than gallon cans, the paddle can be made of correspondingly smaller dimensions as will be understood without sacrificing its described advantages.

Changes and modifications may be made in the illustrative embodiment of the invention described above; and the invention is comprehensive of all such changes and modifications which come within the scope of the appended claim.

I claim:

A paint or the like mixing paddle comprising a handle and an elongated blade; the opposite faces of the blade having each the form of a gen-

erally cylindrical channel extending longitudinally over the blade; and a plurality of holes extending through the blade and spaced apart longitudinally along the blade.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,969,162	Smith	Aug. 7, 1934
1,997,953	Van Der Kuy	Apr. 16, 1935
2,396,903	Valiton	Mar. 19, 1946

FOREIGN PATENTS

Number	Country	Date
124,236	Austria	Apr. 15, 1931