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F. BEKEN

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MIXING MACHINE

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Fig. 1.

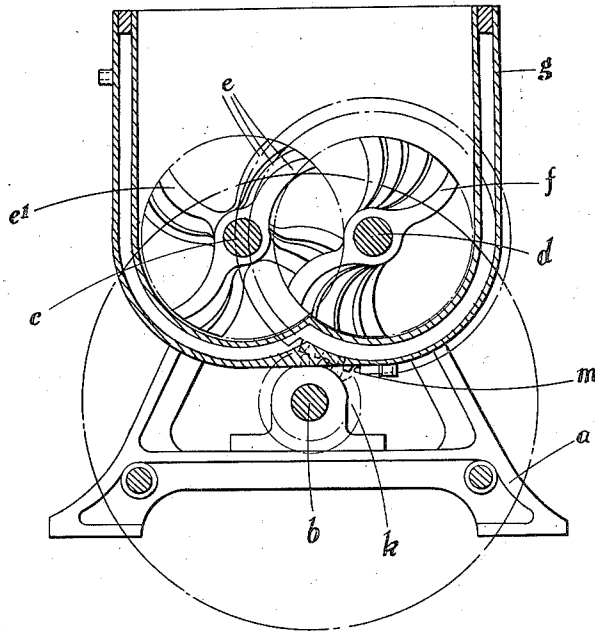
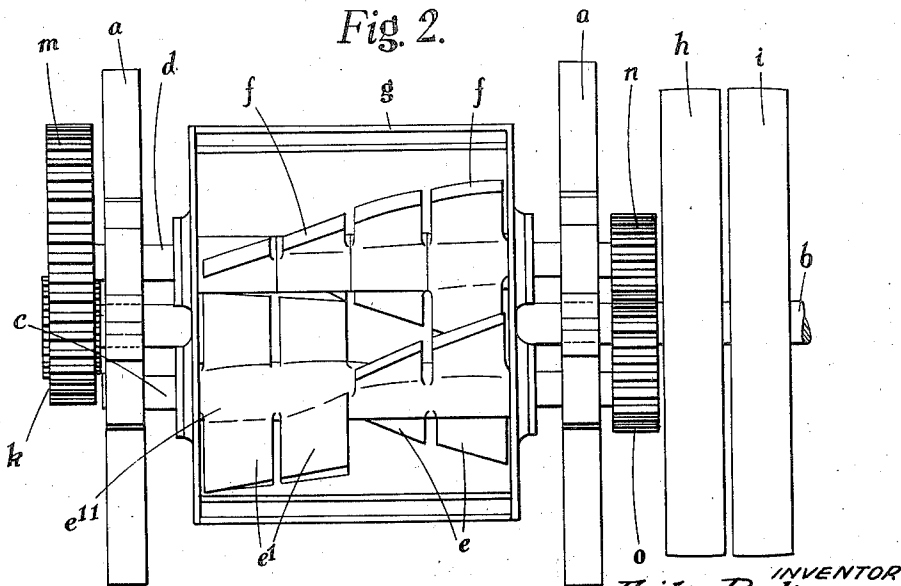


Fig. 2.



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MIXING MACHINE

Fritz Beken, Ilford, England

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In Great Britain July 24, 1935

3 Claims. (Cl. 259—104)

This invention relates to mixing machines and has for its object to provide an improved machine which will intimately mix various materials in a shorter period of time than has hitherto been possible. Even if however the mixing process is not materially hastened by the use of the machine according to this invention, a more perfect mixture is obtained than by other machines of the kind employing rotating beaters, paddles or agitators mounted on two parallel horizontal shafts rotating at different speeds to which the present invention relates.

The improved machine hereinafter described is particularly adapted for mixing plastic materials but may be employed also for mixing granular or powdered materials or even in mixing processes in which a liquid, such as a chemical solution for example, is added to the material under treatment.

A mixing machine of the kind aforesaid according to the present invention is characterized by the fact that the blades of the paddles are so formed that the interengagement of the blades of the paddles on one shaft with the blades of the paddles on the other shaft present opposed surfaces between which the material under treatment is pressed.

Preferably one paddle shaft is adapted to rotate at twice the speed of the other paddle shaft.

The nature of the invention will be however more clearly appreciated by reference to the accompanying drawing, illustrating by way of example one form of mixing machine embodying the invention, similar reference characters referring to like parts in both the figures:—

Figure 1 being a sectional elevation and Figure 2 a plan view.

Referring to the drawing it will be seen that on the main frames or standards *a* of the machine are mounted the mixer driving shaft *b* and the two parallel horizontal paddle shafts *c* and *d* that respectively carry the paddles or beaters *e* and *f* so that they are rotated in the interior of the stationary mixing pan *g* that contains the material under treatment.

The blades of the paddles *e* and *f* in the example illustrated are of curved formation and are spirally disposed on their respective shafts *c* and *d* but the blades *e'* of two of the paddles on shaft *c* are so set that they are at right angles to the remaining blades on the shaft that is they are in a plane which is at right angles to the plane of the blades of the other two paddles on shaft *c*.

The blades may be flat or of any convenient

length or width and of any number on either shaft and they may all be in the same plane. They may have their edges at an angle to the axes of the shafts.

On the driving shaft *b*, driven in any convenient manner as for example by belt drive to the fast and loose pulleys, *h i*, is mounted a spur wheel *k* that meshes with a larger spur wheel *m* on one end of the paddle shaft *d*. On the other end of the shaft *d* is mounted a spur wheel *n* that meshes with a smaller spur wheel *o* mounted on the other paddle shaft *c*. The gear wheels *n* and *o* are preferably in the ratio of two to one so that the paddle shaft *d* rotates at twice the speed of the paddle shaft *c*.

The shafts *c* and *d* are disposed at such a distance apart that the blades of the paddles *e* and *f* interengage in the course of their rotation in opposite directions that is to say as the blades of the one shaft approach the blades of the other they provide opposed surfaces between which the material is pressed and with the method of driving the interengaging paddles ensures what may be termed a "push-and-pull" action on the material under treatment. During one phase of the revolution the more rapidly rotating blades *f* overtake the blades *e*, that rotate at half the speed of the blades *f*, and the material is therefore pushed or squeezed between the two sets of blades, and so is thoroughly kneaded and distributed throughout the whole mass. During the next phase of the revolution the blades *f* have padded the blades *e* and so exert a pulling action on the material, drawing it out or stretching it, which in conjunction with the kneading action of the former phase gives very effective results more especially in the mixing of materials of a plastic nature.

What I claim is:—

1. A mixing machine including parallel shafts, blades mounted on the respective shafts, the blades on one shaft presenting less distance between their adjacent free ends than the similar distance of the blades on the other shaft, and means for rotating one of the shafts at a speed in excess of the rotation of the other shaft, whereby to cause the blades on the shaft of increased speed to interfit between the blades on the shaft of decreased speed and compel a pressing action of the material between the blades on the shaft of increased speed and the leading blade on the shaft of decreased speed and an immediately subsequent stretching of the material between the said blades.

2. A mixing machine including a container,

spaced parallel shafts mounted therein, blades on the respective shafts cooperating for the mixing operation, and means for operating the shafts at different speeds, the distance between the free edges of adjacent blades on the shafts of decreased speed being approximately one-half the distance between the free edges of the blades on the shaft of increased speed, whereby in the mixing interfit of the blades of the respective shafts the blades on the shaft of increased speed will cooperate with the blades on the shaft of

decreased speed to first compel a pressing action of the material and then a stretching action of the material.

3. A mixing machine including a container, spaced parallel shafts mounted for rotation therein, means for operating the shafts to drive one at double the speed of the other, blades in diametrically opposed relation on the shaft of increased speed, and sets of diametrically opposed blades on the shaft of decreased speed.

FRITZ BEKEN.

CERTIFICATE OF CORRECTION.

Patent No. 2,095,907.

October 12, 1937.

FRITZ BEKEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 33, for the word "padded" read passed; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of February, A. D. 1938.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.