June 13, 1939. A. ILLSCHE 2,162,017

BEATING AND MIXING DEVICE

Filed June 28, 1937

Fig. 1.

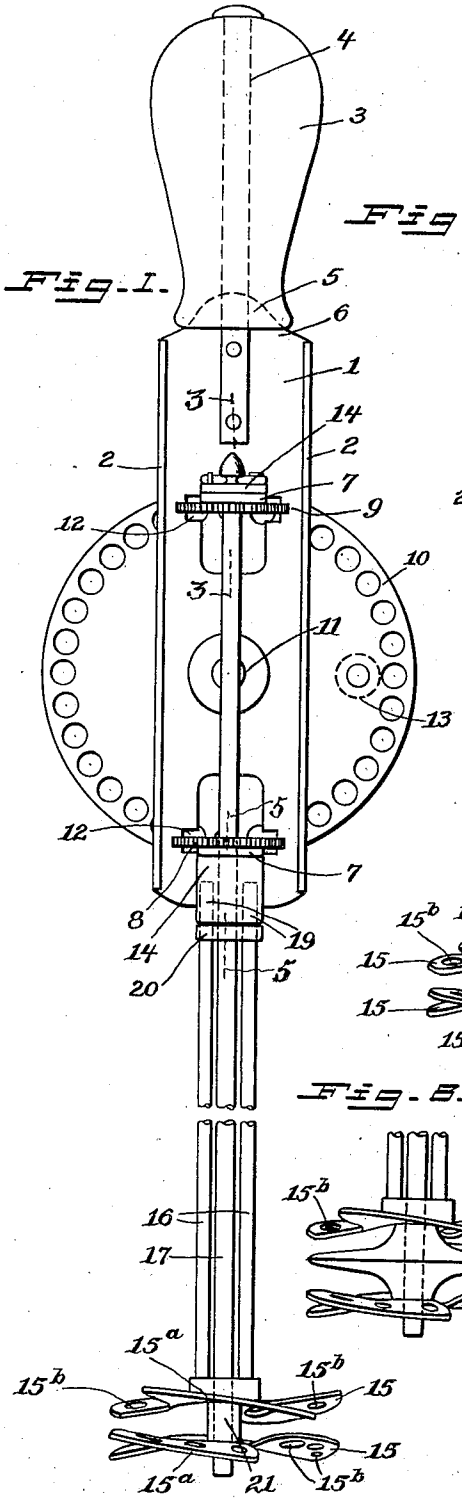


Fig. 2.

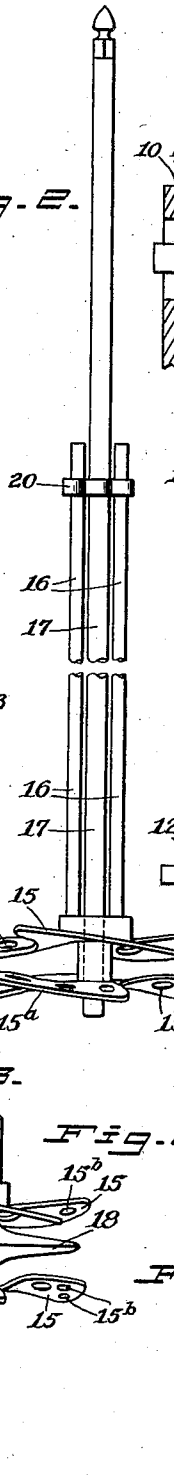


Fig. 3.

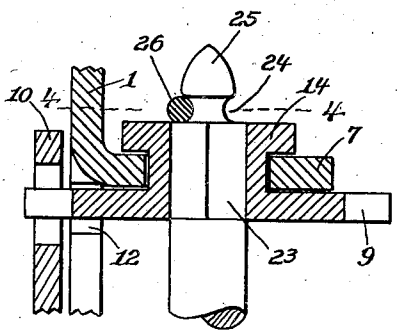


Fig. 4.

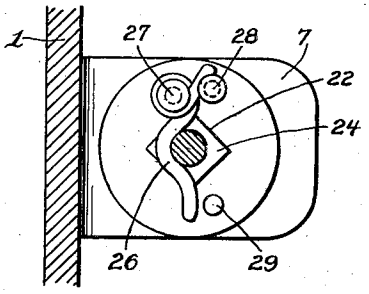


Fig. 5.

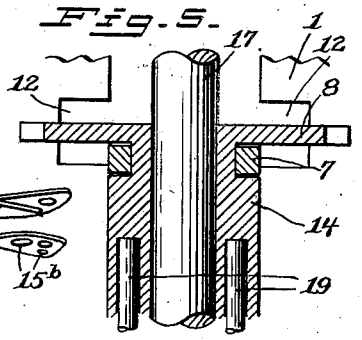


Fig. 6.

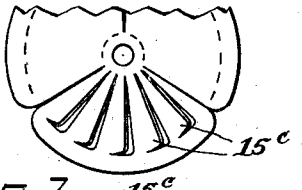


Fig. 7.

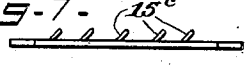


Fig. 8.

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BEATING AND MIXING DEVICE

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Application June 28, 1937, Serial No. 150,795

2 Claims. (Cl. 259—132)

This invention relates to a beater and mixer for use in the preparation of food and drink.

The use of such a device as a kitchen utensil, has become so extensive that the constantly increasing demand for it has induced competing manufacturers to market improved forms from time to time, in an effort to secure sales advantage but all such development appears to have ignored the two principal objections women users have uniformly urged, which apply to these devices as a class.

The main objection is the time and labor required to wash and dry the device after it has been used. This is due to unnecessary complication of the structure, particularly the beater or mixer elements and their mounting, which ordinarily present many inaccessible surfaces and points between closely assembled parts which are practically impossible to reach for purposes of thorough cleansing.

The second objection is that the washing and drying operation is unnecessarily extended, as the entire device, as ordinarily constructed, is inseparably assembled, making it practically impossible to wash the beater and mixer elements and their carrying shafts, which are usually the only parts that need it, without including the gearing by which the elements are driven and the frame carrying the gearing, so that the method commonly followed is to plunge the entire device in the wash water and then laboriously dry it throughout or as far as its structure makes it accessible for drying.

To meet these objections, I employ simple disks formed up to serve effectively as beater and mixer elements, which are spaced apart and present no inaccessible parts. The disks are mounted on exposed shafts in the form of straight separated rods, which are likewise readily accessible and, to reduce the washing and drying operation to a minimum of time and labor, I provide for readily separating the beater and mixer elements and their shafts, as an assembled unit, from the body of the device carrying the gearing, so as to enable this assembled unit to be thoroughly cleansed and replaced without extending the washing and drying operation to the main portion of the device.

The construction and arrangement by which the beater and mixer elements and their shafts may be withdrawn as a unit and replaced, constitutes an important feature of the invention. The principle of operation, which may be termed a push-pull system, is also important here, as no skill, experience nor manipulation of parts is required, it being necessary only to grasp the main portion of the device in one hand and the shafts carrying the beater and mixer elements in the other and pull them apart. A simple spring latch locking the assembly together, yields to the pull and releases the beater and mixer unit, for withdrawal from the body portion of the device. Re-assembling is equally simple, as it is only necessary to enter the ends of the beater and mixer shafts in the openings in the body portion of the device from which they have been withdrawn and push them back into position and the spring latch reengages and locks the assembly together, ready for use.

In addition to the above mentioned features, the invention also includes certain structural improvements in the beater and mixer elements themselves and in the assembly of these elements with an interposed deflector, by which the beating and mixing action is vastly increased and the time of the operation materially shortened.

A hand-operated beater and mixer of a form and construction suitable for carrying my invention into effect, is illustrated in the accompanying drawing but I do not wish to be understood as intending to limit myself to the same, as various changes may be made in both the form and details without departing from the spirit and scope of the invention as outlined in the appended claims.

In the drawing—

Fig. 1 is a view in elevation showing the complete assembly.

Fig. 2 is a similar view of the removable unit assembly of the beater and mixer elements and their carrying shafts.

Fig. 3 is a detail section on the line 3—3 of Fig. 1.

Fig. 4 is a cross section on the line 4—4 of Fig. 3.

Fig. 5 is a detail section on the line 5—5 of Fig. 1.

Fig. 6 is a plan view of a modified form of beater and mixer elements.

Fig. 7 is an edge view thereof, and

Fig. 8 is a view in elevation showing a modification in which a deflector is interposed between the beater and mixer elements.

Referring now to the drawing, 1 represents the body of the utensil which is formed of a metal plate or strip of heavy sheet metal and has the side edges 2 thereof bent up at right angles to stiffen and strengthen it.

At the upper end of the body plate, a handle 3 is secured by a headed bolt 4, which passes centrally through the handle and is split at its lower

end to straddle the body plate to which it is riveted. In addition to the fastening bolt 4, the handle is notched at 5 to receive the rounded projecting end 6 of the body plate.

Suitably spaced apart and in aligned relation centrally of the body plate, two lugs 7 are bent up from cut-outs in the plate and are apertured to serve as bearings for two pinions 8 and 9, which mesh with a gear 10, turning on a stud shaft 11, projecting from the body plate.

As shown, the gear and the pinions are mounted on opposite sides of the body plate which is cut out at 12, for the passage of the pinions into intermeshing relation with the gear.

The gear is provided with the usual crank handle 13 for rotation by hand to drive the pinions and as the latter engage the gear at diametrically opposite points, their rotation will be in opposite directions.

The tooth formation of the gear and pinions may be as shown in the drawing, in which the gear is provided with a circular series of equispaced openings adjacent to its periphery and the pinions are of the ordinary spur type but, if preferred, the gear and pinions may be given any other tooth formation known in the art.

As shown, the gearing is non-removably mounted on the body plate, the stud shaft of the main gear being fixed to the body plate and each pinion secured to its apertured lug by a sleevelike hub 14, which may be permanently connected to the pinion in any of the various ways commonly followed in the art.

The body plate with its attached handle and the above described gearing mounted thereon, constitutes one of the two unit assemblies employed in the make-up of the utensil.

Co-operating with the above mentioned unit assembly and separately associated therewith, there is a second unit assembly which consists of the beater and mixer elements 15 and their separate carrying shafts 16 and 17.

The beater and mixer elements are of disk form, cut and shaped to provide a plurality of inclined blades 15^a on each element, in which openings 15^b are provided to increase the beating and mixing action.

The blade openings may be complete and clean cut, as shown in Figs. 1, 2 and 8, or formed as shown in Figs. 6 and 7, in which radially disposed strips 15^c are bent up from partial cut-outs in each blade and act as small scoops to increase the flow, in the beating and mixing operation, of liquid or other material, through the blade openings.

The elements 15 are arranged one above the other, suitably spaced apart, to rotate in opposite directions about a common turning axis. The lower beater element, rotated clockwise under the right hand drive of the main gear, will force the liquid or other material upward and the upper element, rotated in the opposite direction by the same drive, will force the liquid or other material downward. The two opposing streams, meeting between the elements, will result in violent agitation and thorough mixing of the liquid or other material being acted upon.

As the main flow is radially outward between the beater elements, this flow may be materially increased by interposing a deflector 18, as is shown in Fig. 8, which acts to spread the liquid or other material driven by the beater elements against its opposite faces and shifts the mixing zone to the wider area beyond the circumferential limits of the beaters.

In mounting the beater elements, separate carrying shafts are employed which are spaced apart and practically exposed throughout their entire length, for ease in cleaning.

The shaft 16 of the upper beater element is in the form of twin rods, which are made fast to the hub of the beater and extend upward, in parallel relation, to the hub 14 of the lower pinion 8, in which twin sockets 19 are formed to receive the ends of the rods loosely therein. Just below the socketed hub, the rods are tied together by a metal strap 20, to keep them in proper spaced relation when withdrawn from the sockets.

The shaft 17 of the lower beater is made fast to a sleevelike hub 21 thereof. This sleevelike hub 21 is of sufficient length to come to a bearing against the under side of the hub of the upper beater and serves to space the two apart. From the lower beater the shaft 17 extends upward, loosely through the center bore of the upper beater and loosely through the hub bore of the lower pinion 8, into engagement with the upper pinion 9, by which it is driven.

The sleeve hub of the pinion 9 has a square bore, as indicated at 22 in Fig. 4, and near its upper end, the shaft 17 is squared at 23 to fit the bore, as shown in Fig. 3. Beyond the squared portion of the shaft, a groove 24 is formed and above the groove, the shaft terminates in a pointed end 25.

Engaging the groove 24, there is a spring latch 26, which is designed to yieldingly lock the shaft in engaging relation with the pinion 9. The latch may be of any well known form, but is preferably of such construction as to yield to the passage of the pointed end of the shaft, when the squared portion thereof is inserted in the bore of the pinion hub or withdrawn therefrom and to snap into the groove and lock the shaft, when the latter is pushed home, bringing the groove in line with the latch.

The latch shown is mounted on the flange of the hub of the pinion 9 and consists of a piece of spring wire wound a turn or two around a pin 27, with its short end caught and held under a headed pin 28 and its long end 26 shaped to engage the shaft groove 24 and yieldingly hold the shaft against accidental withdrawal from the hub of the pinion 9. When the shaft is intentionally withdrawn, the latch yields to the passage of the pointed end of the shaft and as soon as it passes, the latch springs back and is held by a stop pin 29, extending across the hub opening just below the center thereof in position to yield when again engaged by the pointed end of the shaft.

From the foregoing it will be seen that the upper beater and its shaft of twin rods are held in operative position by the hub sleeve 21, of the lower beater bearing against the under side of the upper beater hub and further, that the lower beater is yieldingly locked in position by the spring catch engaging the upper end of its shaft. If now it is desired to separate the two unit assemblies, the handled body plate and its gears are grasped in one hand and the carrying shafts of the beaters in the other and the two units may be readily pulled apart, the spring catch yielding, as above described, to permit such action.

When the two unit assemblies are separated, the strap 20 near the upper ends of the twin rods will hold the rods from spreading and maintain them in assembled relation with the shaft 17, as

shown in Fig. 2, but if greater accessibility for washing and drying is desired, the lower beater and its shaft 17, may be withdrawn as a unit or separated from the upper beater and its twin rod shaft, by merely pulling them apart. By the above separation, the previously described two-unit assembly is converted into a three-unit assembly, with no change in either construction or operation.

Re-assembling of the several units presents no difficulty, as it is only necessary to insert the ends of the shafts in the openings from which they have been withdrawn and push or press the parts together until the spring latch on the body member snaps into the shaft groove and the utensil is ready for use.

It is frequently desirable to beat or mix a small quantity of liquid or the like that can be conveniently contained in a tea or coffee cup and as the action of a single beater would be sufficient for this purpose, the several units can be separated, as above described, and the upper beater and its twin rod shaft omitted in re-assembling, thus providing the required single beater for small quantity work. In such an assembly, the beater shaft 17 has a bearing in the hub bore of the lower pinion 8 and it is locked at its upper end against movement in the direction of its length, as the shoulders formed by squaring the shaft near its end, are drawn into abutting relation with the lower face of the pinion 9 by the action of the spring latch in entering the groove to lock the shaft in position.

As the operation and many important advantages of the invention will be apparent from the foregoing description, they will not be further described.

Having described my invention, I claim:

1. A beater and mixer, comprising two unit assemblies, one unit assembly consisting of a body member carrying hand-operated gearing for driving beater and mixer elements, the other unit assembly consisting of beater and mixer elements and their carrying shafts, and a spring latch, carried by a gear on the body member, co-operating with the shaped end of the beater and mixer shaft, driven by said gear, to separably connect the two unit assemblies in operative relation.

2. A beater and mixer comprising two unit assemblies, one unit assembly consisting of a body member having permanently mounted thereon a hand-operated gear and two pinions meshing with and driven by the gear in opposite directions, one of the pinions being shaped centrally for driving connection with a shaft carrying a beater and mixer element, and the other pinion being center-bored for loose passage of the aforesaid shaft and provided with twin sockets arranged one on either side of its center bore, the other unit assembly consisting of two beater and mixer elements and their separate carrying shafts, the shaft of one of the elements being in the form of twin rods extending upward from the element in parallel separated relation and having their upper ends loosely fitted in the twin sockets of the above mentioned pinion, and means for separably coupling the two unit assemblies in operative relation.

ARTHUR ILLSCHE.