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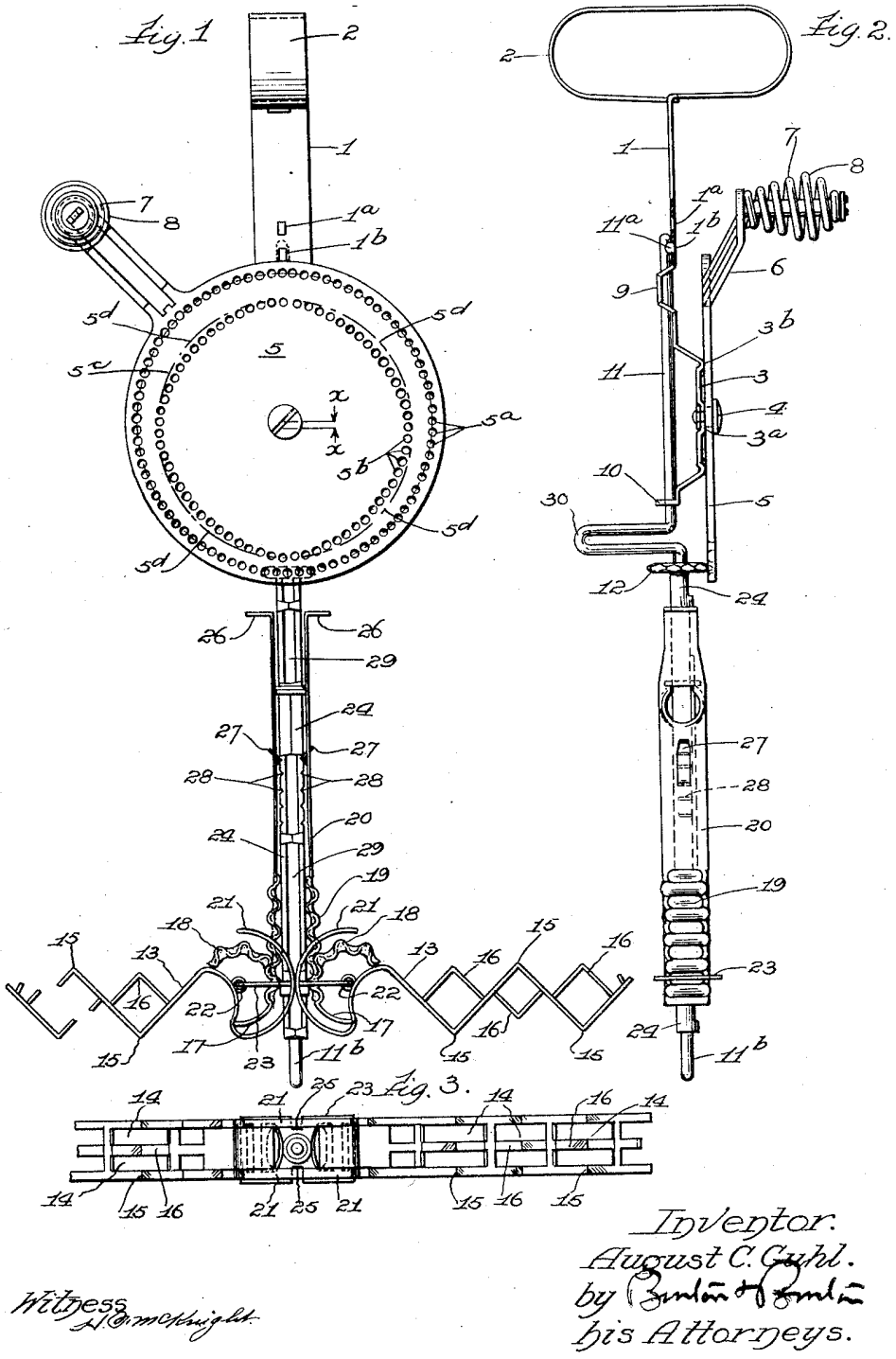
A. C. GUHL

CREAM WHIPPER

Filed June 11, 1926 2 Sheets-Sheet 1



Witness

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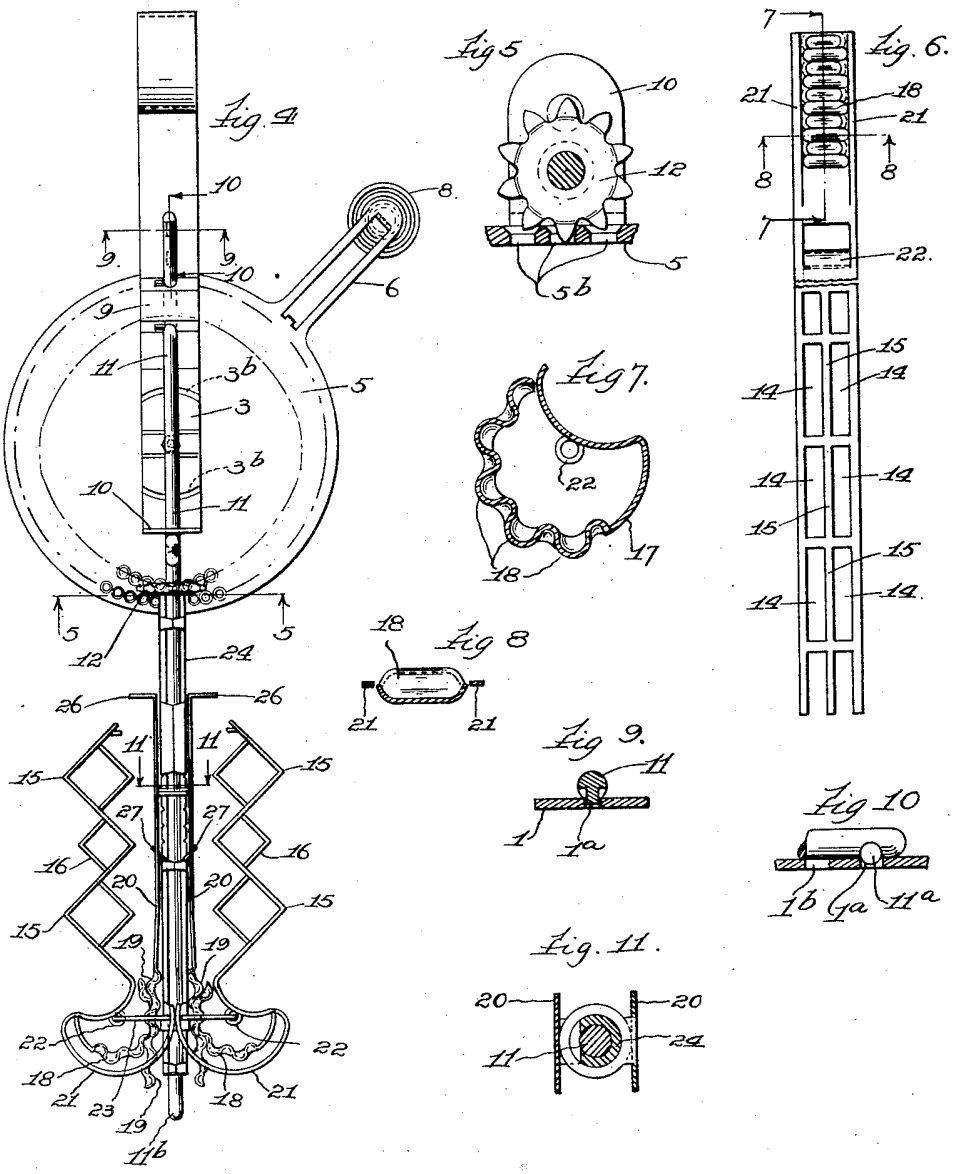

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UNITED STATES PATENT OFFICE.

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CREAM WHIPPER.

Application filed June 11, 1926. Serial No. 115,275.

This invention relates to a tool or machine in the nature of a cream whipper or egg beater and its object is to provide such a device in which the beater elements may be adjusted to suit the particular form of bowl or vessel in which the operation is carried on and in which said beater elements are automatically moved up and down within the body of the material so as to operate upon it more thoroughly than is possible with present constructions. It consists in the various features and elements of construction and their combinations, as herein shown and described and as indicated by the claims.

In the drawings:—

Figure 1 is a front elevation of a cream whipper embodying this invention.

Figure 2 is a side or edge view of the same, with the beater removed.

Figure 3 is a bottom plan view to show the form of the beater elements.

Figure 4 is a rear elevation partly diagrammatic and showing the beater elements folded up for minimum lateral projection.

Figure 5 is a detail section taken as indicated at line, 5—5, on Figure 4.

Figure 6 is a plan view of a blank partially formed in construction of one of the beaters.

Figure 7 is a detail section of a part of the beater as indicated at line, 7—7, on Figure 6.

Figure 8 is a detail section at line, 8—8, on Fig. 6.

Figure 9 is a detail section at the line, 9—9, on Figure 4.

Figure 10 is a detail section at line, 10—10, on Figure 4.

Figure 11 is a detail section at line, 11—11 on Figure 4.

As illustrated in the drawings, the machine includes a handle portion, 1, of flat metal stock bent into a loop at 2 to form a convenient hand-hold and having an offset bend at 3 which supports a journal screw, 4, on which the drive wheel, 5, is rotatably mounted. This wheel is formed with an integral crank arm, 6, somewhat offset from the plane of the wheel and supporting an integral flat crank wrist, 7, upon which a coiled wire handle, 8, is loosely carried. The offset portion, 3, includes a central boss, 3^a, at which the pivot screw, 4, is secured and radially spaced bearing bosses, 3^b, whose contact with the rear face of the wheel, 5, tends to hold it in its plane without undue friction. Above and below the offset, 3, the handle member, 1, is formed with oppositely offset portions, 9 and 10, respectively, which are apertured to engage a rod, 11, which serves as a mounting for the driven gear pinion, 12, and for the beater members associated with it. Preferably the driving features of the wheel, 5, are in the form of perforations in two series, 5^a and 5^b, either of which is adapted to mesh with the teeth of the pinion, 12, as indicated in Figures 2 and 5. To insure satisfactory operation, the perforations, 5^a and 5^b, are countersunk on the side of the wheel toward the pinion, 12, as clearly shown in Figure 5.

Each of the beater arms, 13, consists of a metallic strip formed with rectangular openings, 14, and with transverse angular bends, 15, giving it a zig-zag shape. Reinforcement is provided by bending the mid-ribs, 16, which occur between the openings, 14, in the opposite direction from the lateral marginal portions of the strip, as seen in Figure 1, so that a series of square or diamond-shaped figures is presented when the beater is viewed edgewise. At its inner end each of the beaters terminates in a circularly-curved portion, 17, with corrugations, 18, which act as gear teeth by intermeshing with similar corrugations, 19, of rack members, 20, which are slidably adjustable on the rod or spindle, 11. The segment gear teeth, 18, are formed in the middle portion of the area of the beater strip and the marginal portions, 21, are curved about slightly larger radii so that these parts, 21, of the two beaters will bear against each other as the beaters are angularly adjusted about the centers of their segments. At these centers each beater has a closed eye, 22, formed out of the middle portion of its strip in the area between the beater arm proper and the gear segment, and this closed eye engages through a slot near the end of a cross plate, 23, which is secured to a driving sleeve, 24, rotatably carried on the lower portion of the rod, 11. Inwardly from the slot through which the eye, 22, is hooked, the plate, 23, is formed with a second slot to accommodate the segment, 17, as it rotates about the axis of the eye, 22, while notches, 25, in the edges of the plate, 23, provide guideways and clearance for the segmental rockers, 21. The extreme ends of the segments, 17, are left unattached to the adjacent parts of the beater arms so that the segments can yield to some extent and thus avoid the necessity of extremely close workmanship in the fits between the segments and the racks, 20. The rack

bars, 20, are formed at their upper ends with projecting handle lugs, 26, by which they may be moved up and down for adjusting the beater arms to any desired angle and intermediate between these handles and the toothed portions, 19, the racks are formed with spring detents, 27, which may engage notches, 28, in the surface of the driving sleeve 24, to retain the beater arms at any adjusted position.

Preferably the driving sleeve, 24, is made from flat stock cylindrically curved to fit around the rod, 11, but left with openings, 29, at one side to facilitate cleaning it so that cream or other food stuff will not become pocketed within the sleeve and sour, but may be easily flushed out each time the device is used. At the upper end the sleeve, 24, is rigidly attached to the driven pinion, 12, so as to be rotated with it when the latter is driven by turning of the wheel, 5.

As shown, the outer series, 5^a, of perforations in the wheel, 5, are arranged in a circular track so that when they are engaged with the teeth of the pinion, 12, the rotation of the wheel simply causes rapid rotation of the sleeve, 24, and the beater arms, 17, carried at its lower end by engagement with the plate, 23. When the body of cream or other material is rather deep, however, it is desirable to cause the beaters to traverse the material vertically while rotating in it so as to produce a more thorough whipping action. This is accomplished by meshing the pinion, 12, with the inner track of the perforations, 5^b, which are arranged in strictly circular form but deviate from a true circle at several points. The drawing indicates a circle at 5^c, while it will be seen that at four places denoted by 5^d, the perforations, 5^b, are offset inwardly from this circle. The perforations thus operate as a cam track to shift the pinion, 12, vertically upon the rod or spindle, 11, and thus move the beater arm assembly up and down by a corresponding amount as it rotates. In addition to the non-circularity of the perforations, 5^b, the circle, 5^c, with respect to which this cam track is symmetrical, is itself formed eccentrically on the wheel, 5. The eccentricity, is indicated by the distance between the points of arrows, X, X, on Figure 1. Thus with each rotation of the wheel, 5, the pinion, 12, and the attached beaters are caused to travel vertically by twice this eccentricity, and in addition these parts are reciprocated by the amount of the offset or deviation at 5^d, already described. This insures a thorough beating action throughout the body of the fluid.

For disengaging the pinion, 12, from one set of perforations and shifting it into engagement with the other set, I form the rod, 11, with a double crank arm or offset at 30; the portion of the rod below this crank and on which the pinion, 12, is carried is slightly out of line with the upper portion which is rotatable in the apertured parts, 9 and 10, of the handle member, 1. Thus by turning the rod about the axis of its upper portion, the lower portion carrying the pinion, 12, is swung away from the plane of the wheel, 5, and the teeth of the pinion are withdrawn from the perforations in the wheel. The rod, 11, is then shifted vertically through the openings at 9 and 10 to bring the pinion, 12, into registration with the other perforations of the wheel, 5. Then by turning the rod, 11, again through a quarter turn, using the crank arm, 30, as a handle for this purpose, the teeth of the pinion, 12, are brought into mesh with the perforations as desired. To retain the rod, 11, at either position of adjustment I form a lug, 11^a, near its upper end and provide holes, 1^a and 1^b, in the handle, 1, to receive this lug as a detent at the two respective positions of adjustment. The upper end of the handle member, 1, is adapted to spring sufficiently to allow the lug, 11^a, to snap in or out of these openings.

It may be understood that the lower end of the rod, 11, is smoothly rounded as shown at 11^b, so that it may stand at the center of the bowl or vessel in which the work is to be done. If the dish is broad and flat bottomed, the beater arms may extend horizontally as shown in Figure 1, and if the bottom curves upwardly the arms may be adjusted at any desired angle so as not to scrape against the bottom wall of the dish.

I claim:—

1. In a cream whipper or the like, a beater mounted for rotation about an axis and for reciprocation along said axis, a toothed pinion associated with said beater and a driving wheel having perforations adapted to mesh with the pinion, said perforations being disposed in non-circular arrangement for causing the reciprocation of the pinion and the beater.

2. In a cream whipper or the like, a sleeve and a beater carried thereby, a pinion fixed to the sleeve, a support on which the sleeve is mounted for rotation and reciprocation along its axis and a driving member arranged to mesh with the pinion having an axis eccentric of its axis of rotation and having a pitch line of varying radius with respect to said eccentric axis, whereby the actuation of the pinion by said driving member causes two separate reciprocating movements of the sleeve as well as its rotation upon the support.

3. In a cream whipper or the like, a support comprising a rod, a sleeve rotatably mounted on the lower portion of the rod, beaters carried by the sleeve, a handle secured to the upper end of the rod and driving means for the sleeve, said rod being bent laterally and doubled upon itself between its upper and lower portions to provide a spring cushion.

4. In the construction defined in claim 3

foregoing, a pinion rigidly associated with the sleeve on the lower portion of the rod, and a driving gear for said pinion supported on the upper portion of the rod, the sleeve being slidable longitudinally to keep the pinion in mesh with the driving gear.

5. In the construction defined in claim 3, a pinion rigidly associated with the sleeve on the lower portion of the rod, a driving gear for said pinion and journaling means for said gear in which the upper portion of the rod is rotatable, the lower portion below the lateral bend being slightly offset from the axis of the upper portion, whereby the pinion is swung out of mesh with the gear by rotation of the rod.

6. In the construction defined in claim 3, a pinion on the sleeve and a driving gear for said pinion, journaling means for the gear in which the upper portion of the rod is rotatable, the lower portion of the rod being offset from the axis of the upper portion, whereby the pinion is swung out of mesh with the gear by rotation of the rod, the driving gear having means to co-operate with the pinion arranged at two separate pitch lines on the gear, and the sleeve being slidable on the rod for shifting the pinion from one pitch line to the other.

7. In a cream whipper or the like, a rotor and a beater arm pivotally attached thereto, a gear segment on the beater and a gear member meshing therewith, carried by the rotor for adjusting the angular relation of the arm to the axis of rotation of the rotor.

8. In a cream whipper or the like, a rotor with a beater arm pivotally attached thereto, a gear segment on the beater adjacent its pivot and a rack meshing with the segment slidably carried by the rotor for adjusting the angular relation of the beater arm thereto.

9. In a cream whipper or the like, a rotor with a beater arm pivoted thereto, a gear segment on the beater and a rack meshing therewith slidably carried by the rotor for adjusting the angle of the beater arm, together with detent means for securing the rack at a plurality of positions of adjustment.

10. In a cream whipper or the like, a rotor with a plurality of beater arms pivoted thereto and extending in radial planes from the rotor, each arm having a gear segment and gear means carried by the rotor meshing with said segments for adjusting the angular relation of the arms to the axis of rotation of the rotor.

11. In the combination defined in claim 10, said gear means being separate for the respective beater arms for adjusting their angular relation independently of each other.

12. In a cream whipper or the like, a beater arm made of flat stock bent in zig-zag formation with longitudinal slits and portions between said slits bent in opposite zig-zag arrangement.

13. In a cream whipper or the like, a beater arm made of flat stock in the form of a strip with two longitudinal rows of oblong apertures formed therein, the marginal portions of the strip being bent transversely at points intermediate the ends of said oblong openings to produce an arm of zig-zag form, and the stock of the strip between said openings being bent oppositely to the marginal portions to provide braces for the zig-zag form.

14. In a cream whipper or the like, a rotor sleeve with a plate secured near its lower end extending in a plane perpendicular to the axis of rotation, a pair of beater arms, each formed of flat stock pivotally supported by said plate and extending in opposite directions therefrom, the inner end of each arm being circularly curved about its pivotal connection with the plate, and such curved portion having gear teeth formed in it, and a rack bar slidably mounted on the rotor sleeve with teeth meshing with those of the beater arm for adjusting the angle of the arm with respect to the rotor axis.

15. In the combination defined in claim 14, the marginal portions of the inner end of each beater arm being curved concentrically with respect to the toothed portion with larger radii which permit said curved marginal portions of the two beater arms to roll against each other as the arms are adjusted about their pivots.

16. In the combination defined in claim 1, said driving wheel having a plurality of points in the non-circular series of perforations disposed at equal radial distances from a central point for causing a plurality of reciprocations of said pinion and its beater in each rotation of said driving wheel.

17. In a cream whipper comprising rotary beater arms, means adapted to reciprocate said arms bodily along the axis of their rotation during the rotary movement, and selectively operable means for rotating said beater arms in a given plane.

18. In the combination defined in claim 17, said reciprocating means including a rod with an offset portion, a pinion mounted on the offset portion for rotating the beater, a driving gear having meshing engagement with said pinion about an axis eccentric of its axis of rotation, said selective means including a portion of said driving gear formed for meshing engagement with the pinion about a second pitch line concentric with its axis of rotation, and a handle on said rod adapted to swing the pinion into and out of mesh with said driving gear at either pitch line.

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