June 23, 1936. P. C. WIEGANDT 2,045,171

BEATER

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Fig. 1.

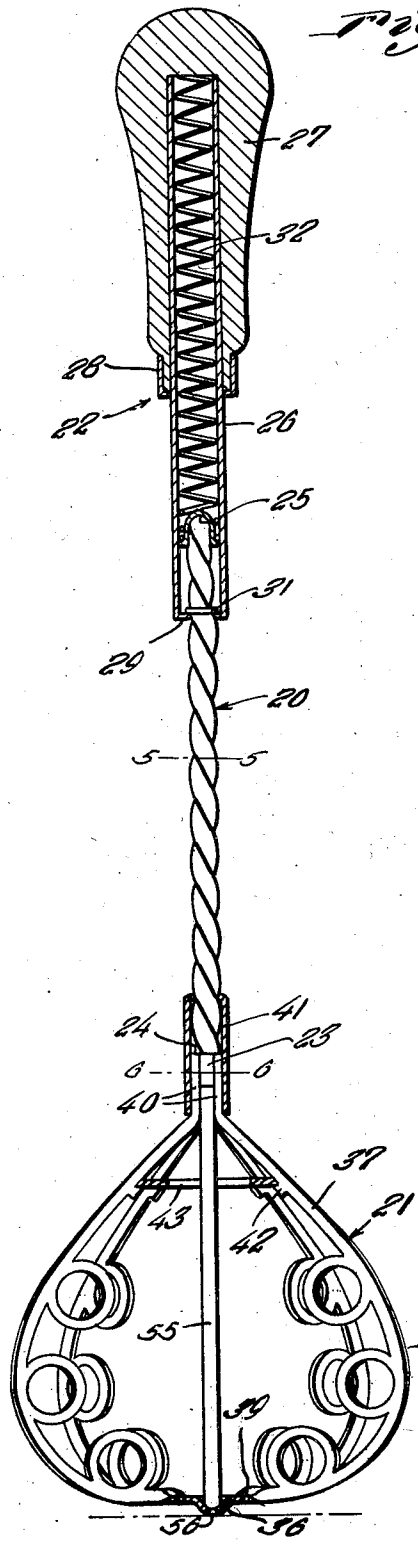


Fig. 6.

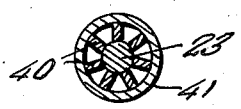
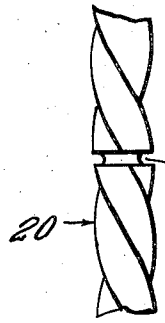


Fig. 7.



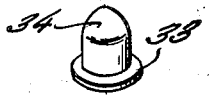


Fig. 8.

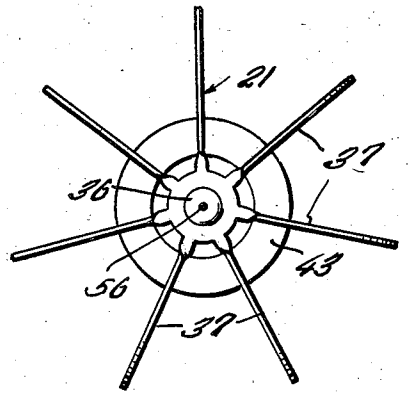


Fig. 2.

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Fig. 3.

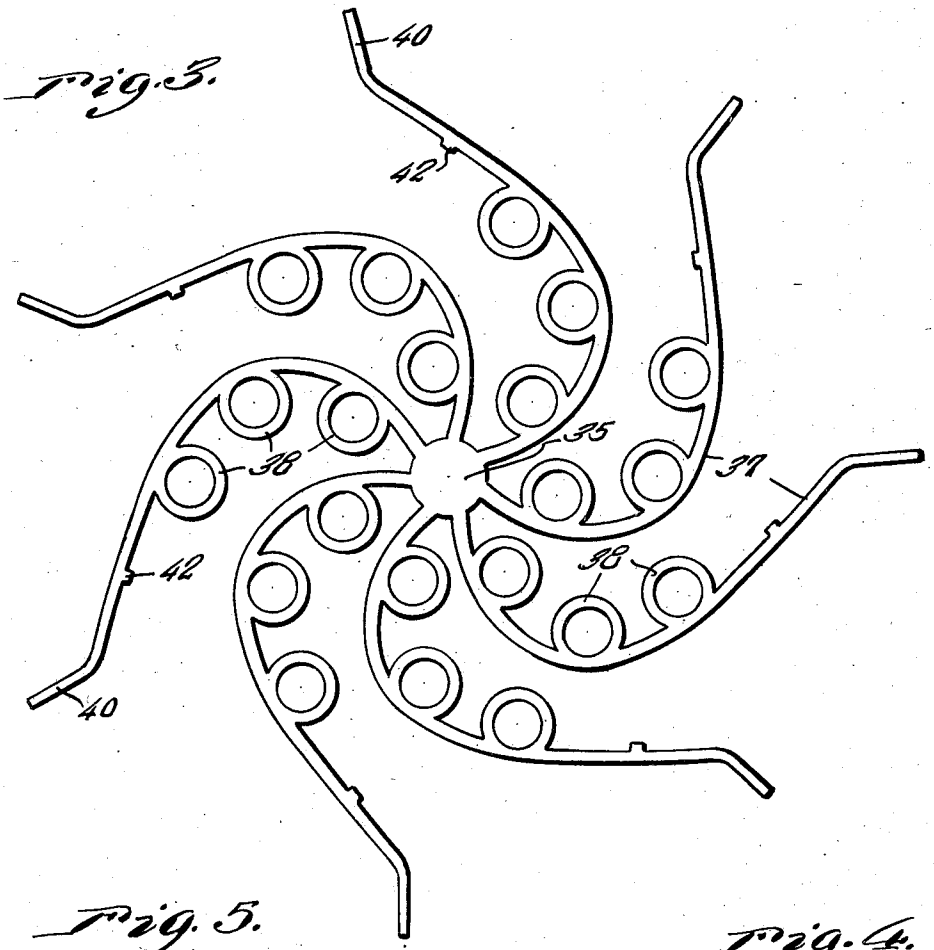


Fig. 5.



Fig. 4.

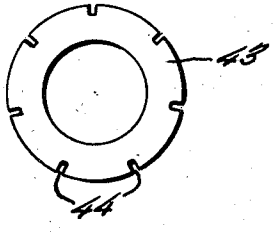
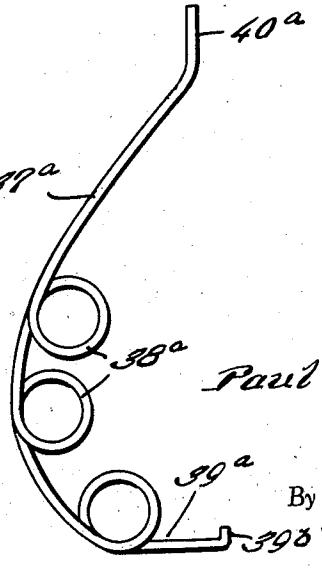


Fig. 11.



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Fig. 9.

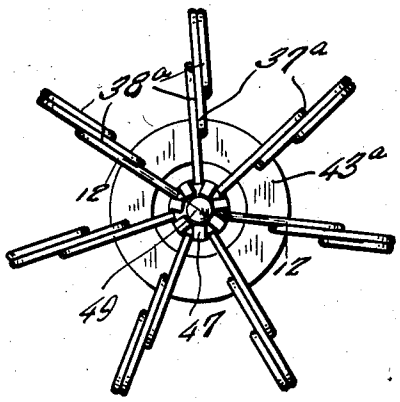


Fig. 10.

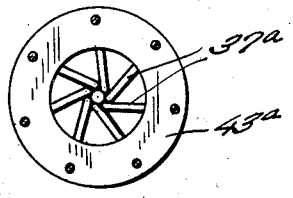


Fig. 12.

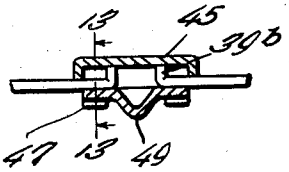


Fig. 15.



Fig. 16.

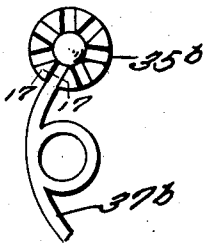
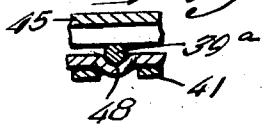


Fig. 13.



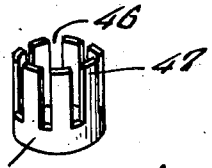
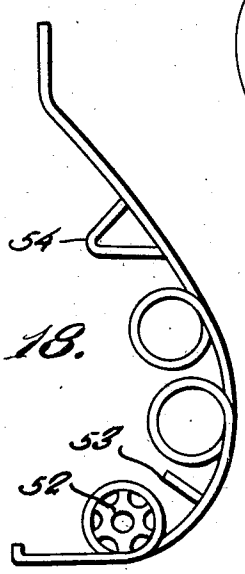


Fig. 17.



Fig. 14.

Fig. 18.



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UNITED STATES PATENT OFFICE

2,045,171

BEATER

Paul C. Wiegandt, Brooklyn, N. Y.

Application December 22, 1933, Serial No. 703,657

3 Claims. (Cl. 259—128)

This invention relates to beaters of the type designed for beating eggs, cream, dough, and the like, and among the objects of the invention are, to provide, in a manner hereinafter more fully set forth, a beater of the rotary type characterized by simplicity and economy of structure; a head for the beater of improved and novel design having the requisite amount of flexibility and strength; and in general to provide a beater of the character suggested having therein provision for properly aerating the food product being whipped, as well as other features of construction which will permit of a thorough cleansing of the beater after each use thus insuring full sanitation.

The invention together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a sectional view taken through the improved beater.

Figure 2 is a bottom plan view thereof.

Figure 3 is a plan view of the blank from which one form of head for the beater is formed.

Figure 4 is a plan view of an annular plate hereinafter more fully referred to.

Figures 5 and 6 are transverse sectional views taken substantially on the lines 5—5 and 6—6 respectively of Figure 1.

Figure 7 is a fragmentary elevational view of the beater rod.

Figure 9 is a bottom plan view of a modified form of beater head.

Figure 10 is a horizontal sectional view through the beater head of Figure 9.

Figure 11 is a side elevational view of one of the blades forming part of the beater head construction of Figure 9.

Figure 12 is a detail sectional view taken substantially on the line 12—12 of Figure 9.

Figure 13 is a detail sectional view taken substantially on the line 13—13 of Figure 12.

Figure 14 is a perspective view of a hub element.

Figure 15 is a perspective view of a complemental hub element.

Figure 16 is a fragmentary plan view illustrating a modified form of hub and blade assembly.

Figure 17 is a detail sectional view taken substantially on the line 17—17 of Figure 16 and

Figure 18 is a side elevational view of a blade illustrating the various forms which the projections on the blades may assume in the contemplation of the invention.

Referring to the drawings by reference numerals it will be seen, that in general, the beater comprises a spirally twisted rod 20, a beater head 21 connected with the lower end of the rod 20 to rotate therewith, and an operating handle 22 for the rod 20 and suitably associated therewith so that by reciprocating the handle 22, when the beater is in proper bearing engagement against the bottom of the receptacle containing the material to be whipped, the rod 20 and 21 will be caused to rotate first in one direction and then in another, thereby thoroughly agitating the material to be whipped.

In the present and preferred form of the invention the rod 20 is preferably formed from a suitable section of rod that is substantially square in cross section the faces of which are concaved, and which rod is spirally twisted as shown. At the lower end thereof the rod is provided with a reduced section 23 and a shoulder 24. At its upper end the rod 20 is somewhat tapered and round in form as at 25.

The handle 22 comprises a tubular casing 26 to the upper end of which is applied a socket 27 of wood or any other suitable material. At its lower end the socket or handle grip 27 is reduced and provided with a suitable ferrule 28. The tubular casing 26 at its lower end is provided with an integral cap 29 provided with an opening that is substantially the same shape as the cross sectional shape of the rod 20, the cross sectional shape of the rod 20 being clearly shown in Figure 5. At a suitable point in its length spaced downwardly from the upper end 25 the rod 20 is provided with a circumferential groove 30 with which is suitably engaged a stop disk 31 and with which the cap 29 normally abuts. The rod 20 is normally held in the position shown in Figure 1 through the medium of a spring 32 housed within the tubular casing 26 and at its lower end bearing against an outstanding flange 33 provided on the lower end of a cap 34 fitting the end 25 of the rod 26, the lower portion of the spring 32 embracing the cap 34 as shown in Figure 1. By having the end 25 of rod 20, and the cap 34 shaped as shown friction is reduced to a minimum.

The head 21 may embody the invention in any one of several forms. For example, the head 21 shown in Figure 1 is formed, as suggested in Figure 3 from a blank cut, shaped and dimensioned to provide a center hub 34, the same being in the form of a disk having pressed from the center thereof a substantially conical bearing or pivot teat 36. Integral with and extending from the

hub 35 is a circular series of blades 37 which are in the form of irregularly curved thin strips having integral therewith on the convex edge thereof inwardly extending agitator-projections 38, which in the form of the invention shown in Figure 3 have the forms of flat rings or annuli.

In the forming of the head, after the blank has been cut and shaped to the design of Figure 3 the blades or strips 37 at the ends thereof integral with the disk 35 are longitudinally twisted as indicated at 39 in Figure 1 and directed upwardly in a manner to give a substantially bulbous contour or shape to the head. At their free ends the blades 37 converge and have end sections 40 bent at a suitable angle and disposed in vertical planes.

In assembling the head 21 and shaft 20 the ends 40 of the blades are crowded about the reduced section 23 of the shaft or rod 20 and in abutting relation with the shoulder 24 of the rod.

To secure the head 21 on the rod 20 there is provided a ferrule or sleeve 41 to the lower end of which are secured in any suitable manner the ends 40 of the blades 37.

Inwardly from the ends 40 thereof the blades 37 are provided with inwardly directed lugs or projections 42, and disposed within the confines of the blades is a circular apertured plate 43 to the underside of which the lugs 42 are secured in any suitable manner with the blades 37 engaging in notches 44 provided on the peripheral edge of the plate 43. The plate 43 will serve to strengthen the structure at this point while the lugs 42 will serve to force the air downwardly toward the greater diameter of the head 21 to insure the maintenance of air spaces sufficient to thoroughly aerate the food product being whipped during the rotation of the head.

It might be stated that the blank from which the head 21 is made after the parts thereof have been suitably relatively arranged in completing the formation of the head, and also subsequent to the assembly of the entire element is, together with the completed assembly tin-dipped or otherwise treated, to prevent rust, and to otherwise enhance the appearance of the beater.

From the description of the invention thus far, it will be seen that in operation, downward pressure on the handle or grip 27 when the teat 36 rears against the bottom of the receptacle containing the material to be whipped, causes the handle to move down on the rod 20 in opposition to the action of the spring 22 with the result that the rod 20 and the head 21 will be caused to rotate in one direction by reason of the engagement of the spiral with the edges of the opening in the cap 29. As soon as the operator relieves the pressure on the handle, the recoil of the spring 32 exerts a pressure on the handle 27, causing the latter to rise with the result that the rod 20 and head 21 will be caused to rotate in the opposite direction. It will thus be seen that by reciprocating the handle 27 relative to the rod 20 said rod 20 and head 21 will be caused to rotate first in one direction and then in another, thereby thoroughly agitating the material to be whipped.

In the form of the invention shown in Figures 9, 10, 11, 12, 13, 14 and 15 the head of the beater instead of being stamped from one piece comprises a plurality of individual elements including the blade 37*a*, each of which is formed from a single length of wire having an irregular curvature and having portions thereof coiled to provide inwardly projecting coils or rings 38*a* corresponding to the rings 38 hereinbefore referred to. The blades 37*a* are also formed at their upper free end as at 40*a*, while at their base ends 39*a* the blades are clamped to a hub which as shown in Figures 12 to 15 inclusive comprises a substantially cylindrical member 45 which in its periphery is provided with a series of notches 46 which accommodate the ends 39*a* of the blade. Said ends 39*a* are also provided with laterally disposed portions 39*b* that abut the closed end of the cylinder 45 as shown in Figure 12. The ends 39*a* of the blades are clamped between the closed end of the cylinder 45 and a circular crimped plate 48 which is secured in position by bending the fingers 47 formed by the slots 46 over the plate 48 in a manner suggested in Figure 12. The plate 48 has its center portion pressed out to provide a conical teat or bearing portion 49.

The ends 40*a* are secured to the rod 20 in substantially the same manner in which the ends 40 of the blades 37 are secured to said rod 20 and consequently further detailed description of this feature is deemed unnecessary.

Also, completing this form of the invention is a circular apertured plate 43*a* that is provided with a circular series of openings through which the upper end of the wire blades 37 extend. The plate 43*a* is secured fixedly to the blades 37*a* in any suitable manner as by electric welding or the like. Also, the fingers 47 subsequent to the bending thereof over the plate 48 will be electrically welded or otherwise secured to the plate 48.

In the form of the invention shown in Figures 16 and 17 there is suggested the manner of using blades 37*b* which are identical with the hereinbefore described blades 37 but which are separate from the center disk or hub. In this form of the invention the center disk or hub indicated by the reference numeral 35*b* as a radial series of grooves 50 pressed out therefrom in a manner clearly shown in Figure 17 to accommodate the base ends of the blades 37*b*. With the base ends of the blades 37*b* properly fitted within the groove 50 a press or the like is utilized for contracting the grooves 50 in a manner indicated at 51 to secure the base ends of the blades 37*b* within said grooves or channels 50, and consequently the blades and hub disks in assembled relation. In this latter form of the invention it will of course be understood that in shaping the beater head the blades 37*b* at their base portions will be twisted in substantially the identical manner in which the blades 37 are twisted at 39 relative to the disk 35.

As hereinbefore intimated the projections on the blades may assume various shapes, as for example such projections may be in the shape of disks such as indicated at 52 in Figure 18 with the disks suitably perforated as suggested therein. Also such projections may have the form of a single arm such as indicated at 53 or the form of a triangular projection such as indicated at 54 in Figure 18.

In some instances it is preferred for strengthening purposes to provide a center post such as indicated at 55 in Figure 1. Where this post is used the same extends through the axial center of the beater head and has one end extending up between the ends 40 of the blades 37 within the sleeve or ferrule 23 while at its lower end the post is provided with a reduced or chin portion 36 that extends through an aperture provided therefor in the apex of the teat 36 as also shown in Figure 1. To secure the ends of the blades to

the rod of the beater the sleeve is contracted at one end about the rod and at its opposite end about the ends of the blades grouped about the reduced end of the rod.

It might be mentioned that constructing the blade in the manner mentioned by the blades **37** there are no spaces between the parts as occur between the convolutes in the blade structure **37***a* where the material being whipped may accumulate and which is not easily removed when cleansing the beater although it will be apparent that with either construction of beater head the beater will be efficient in operation, thoroughly sanitary and can be simply and economically constructed.

Having thus described my invention, what I claim as new is:

1. In a beater having a shaft and means for rotating the same; said shaft having a free end reduced in diameter providing a shoulder inwardly from the terminal of the shaft, a beater head comprising a hub member having a series of whipping blades connected at one end with the hub and having free ends paralleling the reduced end of the shaft and abutting said shoulder, a sleeve disposed about said shaft and the last named ends of said blades, said sleeve having an end portion contracted about said shaft and a second end portion contracted about said last named ends of the blades for securing the beater head to the shaft, said hub at the center thereof being provided with a substantially conical pivot teat, and a reinforcing rod having an end in abutting relation with the reduced end of the shaft and a second end fitting in said depression, and each of said blades on the inner edge thereof having integral therewith a series of spaced agitator projections disposed in a plane normal to the plane of the blades, and said blades adjacent the ends thereof secured to the shaft being provided on their inner edges with integral projections, and an annular plate disposed about the reinforcing rod, said plate at the peripheral edge thereof resting on said projections and secured to the projections.

2. A stirrer head for beaters comprising a body cut from a single blank of metal and including a central disk-hub having a plurality of elongated curved stirring blades extending radially therefrom, and a series of relatively spaced substantially circular agitator projections integral with the concave edges of said blades, said blades at the ends thereof integral with the disk-hub being longitudinally twisted to extend in a plane substantially at right angles to the plane of the disk-hub, the free ends of the blades being adapted for attachment to the rotary shaft of a beater.

3. A stirrer head for beaters comprising a plurality of stirring blades, a hub provided in its periphery with a circular series of notches and fingers between the notches, said blades having one end engaging in the notches in the hub, a circular crimped plate arranged within the hub and cooperating therewith for securing said ends of the blades to the hub, and said fingers being clinched over said plate for securing the latter within the hub.

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