Feb. 28, 1939. J. R. SEARIGHT 2,149,104

WHIPPING AND BEATING DEVICE

Filed March 6, 1937

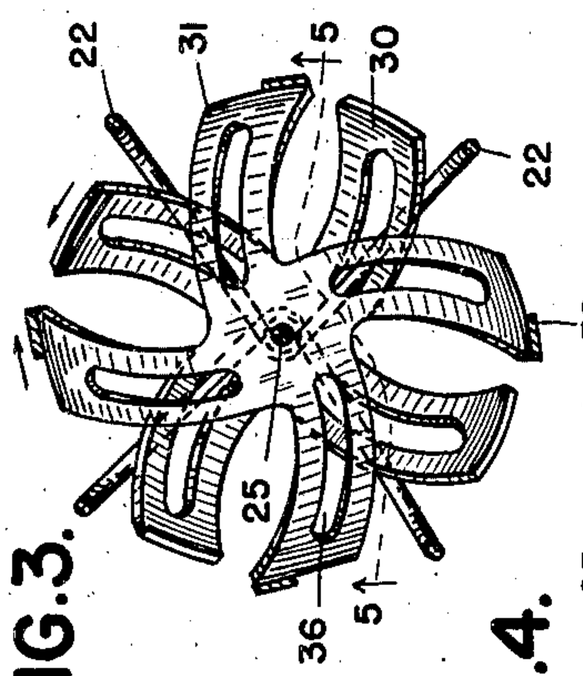

FIG.3.

FIG.4.

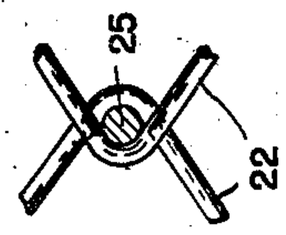

FIG.6.

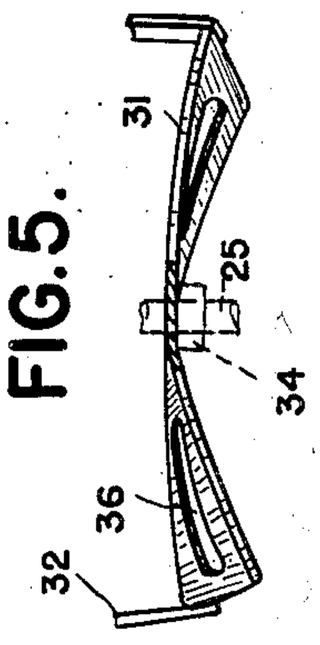

FIG.5.

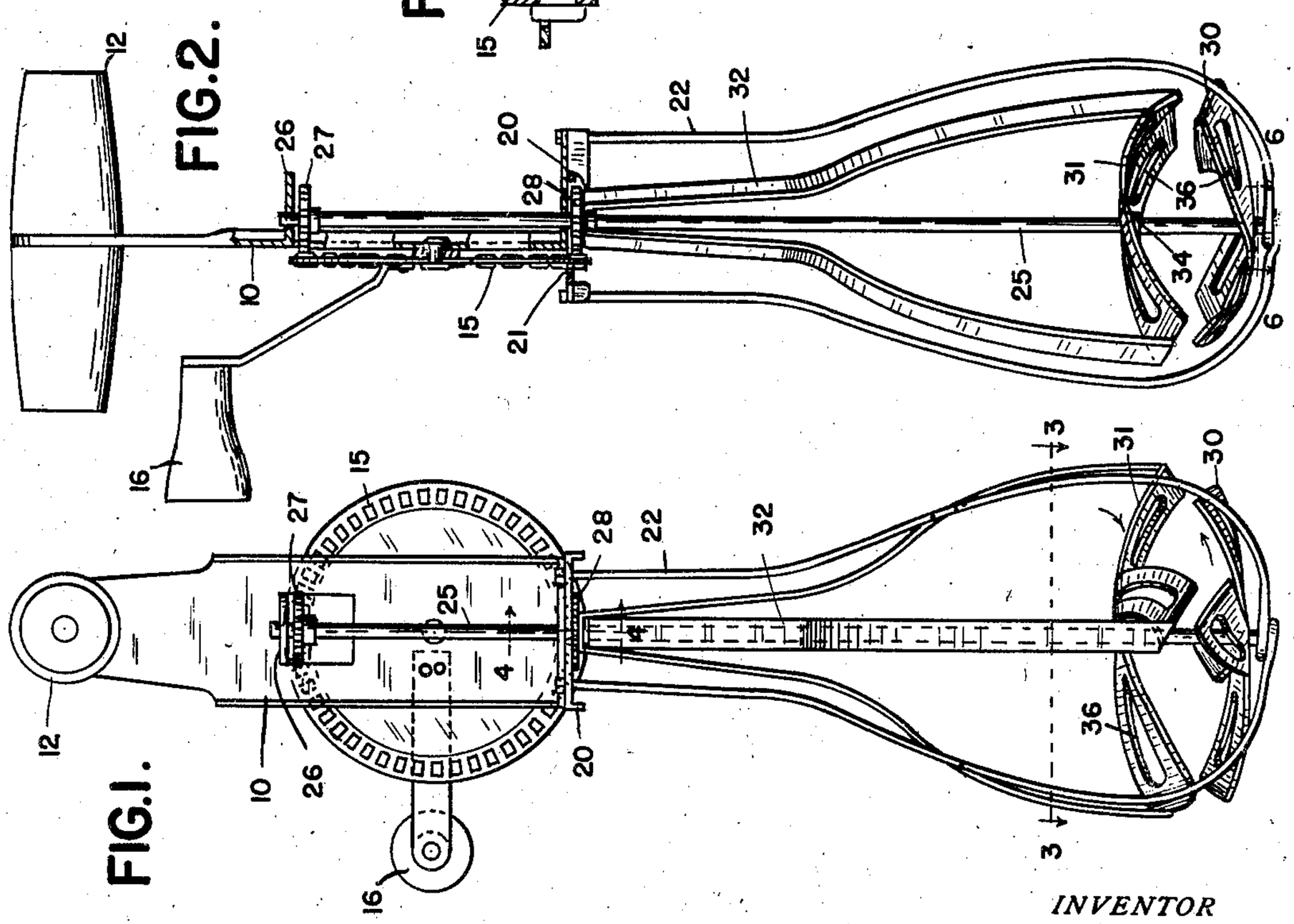

FIG.2.

FIG.1.

INVENTOR
JOHN R. SEARIGHT

BY Brown, Pryce, Hardesty
ATTORNEYS

Patented Feb. 28, 1939

2,149,104

UNITED STATES PATENT OFFICE

2,149,104

WHIPPING AND BEATING DEVICE

John R. Searight, Birmingham, Mich., assignor of one-half to Evangeline S. Bleazby, Birmingham, Mich.

Application March 6, 1937, Serial No. 129,365

1 Claim. (Cl. 259—132)

This invention relates to whipping and beating devices for food-stuffs and the like. An important object of the invention is to provide an improved construction, adapted for either hand or power operation, quicker and more efficient in operation, and so constructed as to tend to draw into itself the material being worked upon, overcoming the usual tendency of centrifugal force to throw the material outward and away from the beaters, by a centripetal action which constantly tends to draw the material inwardly to the beaters where it is agitated and broken up in a novel and very effective manner.

A further object is to provide such a beating device having a pair of rotatable beater heads, each of which is so shaped as not only to draw the material toward itself, but thereafter to throw such material toward the other beater head, the combined action of the two heads tending to draw and hold the material in the space between them, where it is subjected simultaneously to the action of both.

A further object comprises the provision of such an improved beater which is of very simple and inexpensive construction, in which guards are provided for the beaters, such guards also acting to assist the beating action and to provide a journaled bearing for rotatably supporting at least one of the beater heads.

Other objects and advantages will be apparent from the following description, wherein reference is made to the accompanying drawing illustrating a preferred embodiment of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawing:

Figure 1 is a rear elevational view of a hand operated beater suitable for household use and incorporating the principles of this invention.

Figure 2 is a side elevational view of the same, partly broken away.

Figures 3 and 4 are cross sectional views taken substantially on the lines **3—3** and **4—4** respectively of Figure 1, looking in the direction of the arrows.

Figure 5 is a cross sectional view of one of the beater heads, taken substantially on the line **5—5** of Figure 3 and looking in the direction of the arrows; and

Figure 6 is a detailed cross sectional view of the lower bearing for the beater shaft, taken substantially on the line **6—6** of Figure 2.

Referring now to the drawing, reference character **10** designates a sheet metal frame plate, forming the main support for the device. The vertical edges of the plate are flanged for stiffening, and at its top a fixed handle **12** is provided. Journaled upon one face of the plate is a driving gear wheel **15**, shown as adapted to be revolved by a crank handle **16** secured thereto, although it will be appreciated that power operation of the beaters is within the contemplation of my invention. To the bottom of the frame plate **10** is secured a transverse bracket plate **20**, also of sheet metal, through a slot **21** in which the gear wheel extends and is freely rotatable, such slot allowing the beater pinion **28** located beneath the bracket plate to mesh with the teeth of the driving gear, which teeth may be integrally pressed in the surface of the driving gear near its periphery.

The bracket plate supports, approximately at its four corners, the ends of looped guard wires **22** which may be extended through and welded or otherwise secured to the bracket. At their bottoms the wires **22** are looped around an enclosed area in alignment with the beater shaft **25**, to provide a bearing for the lower end thereof. Such shaft extends centrally through the space within the guard wires, and projects upwardly through the bracket plate **20**, extending parallel and close to the plate **10** upon the opposite side thereof from the driving gear wheel **15**. At its upper end the shaft is journaled in a bearing lug carried by the frame plate for that purpose and which may be integrally struck out of the material thereof.

The driving pinion **27** for the shaft is fixed thereupon directly beneath the upper bearing lug **26**, and extends freely through a slot (undesignated) in plate **10** to mesh with the toothed portion of the wheel **15** at the top of such wheel. Upon the lower end of the shaft is secured a beater head **30**, the construction of which will presently be considered in detail. A cooperating beater head **31** of similar shape but reversed in position and adapted to rotate in the opposite direction is loosely mounted upon the shaft in a position slightly spaced above the beater head **30**, and is rotatable by means of the pinion **28**. Pinion **28** is loose upon shaft **25**, and meshes with the bottom of the wheel, engaging the toothed portion thereof which projects downwardly through the plate **20**, as previously stated.

Sheet metal driving arms **32**, so shaped as also to assist in the beating action, are secured to the pinion **28** and extend downwardly to the tips of the four arms of the beater head **31** to drive the same. As best shown in Figure 3, the arms **32** are also inclined outwardly in their direction of

rotation, in such manner that they tend to throw inwardly the material in which they are rotated during operation of the beater (when turned in the normal direction by a right-handed person).

A collar **34** fast upon the shaft directly beneath the upper beater head **31** supports such head, together with the assembly comprising its driving arms **32** and the pinion **28**, while allowing free rotation of such assembly in a direction opposite to that in which the shaft and lower head are driven.

The beater heads are shown as provided with four blades each, although their number is subject to variation. The blades are so shaped as to throw fluid material in which they are rotated toward each other, the upper head **31** throwing the material downwardly and the lower head **30** throwing it upwardly. For this purpose each blade is twisted longitudinally, while in order to urge the material inwardly and provide a centripetal force greater than any centrifugal force the material can develop, the blades are also curved forwardly in the direction of their rotation, giving them a scoop-like action. The resultant tendency of the beaters to urge the material inwardly prevents the common but undesirable tendency of most beaters to throw the material to the outside and away from the beaters. Such undesirable centrifugal action is also largely neutralized in the present construction by the rotation of the two beaters in opposite directions, while, further, the driving and beating arms **32** are so shaped, as previously stated, that their tendency also is to scoop and drive inwardly the material in which they are rotated. The described centripetal action, in conjunction with the additional tendency of the beaters to throw the material from one to another, results in a very effective beating action which creates a maximum of disturbance in the material, such action being assisted by the supports **22** as well as the arms **32**.

Slots as **36** preferably extend longitudinally of the beater blades of the beater heads, the twisting of which will be seen to be such as not only to provide simultaneous propeller-like and scooping action, but to provide an enclosed space of substantial size between the paths of the rotating beaters, the arms of the lower beater **30** being curved upwardly toward their tips, while the arms of the upper beaters are curved downwardly. The material being worked upon tends to remain within and to flow into this area between the beater heads, where it is most violently agitated.

While it will be apparent that the illustrated embodiment of my invention herein disclosed is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claim.

What I claim is:

A beating device comprising a frame, a pair of impeller-like agitator elements spaced from each other and rotatable in opposite directions about a common axis, each agitator element comprising a plurality of blades, the blades of each element being twisted longitudinally and curved toward the other agitator element, and also curved forwardly in the direction of rotation, whereby the blades of each element tend simultaneously to scoop and throw material worked upon inwardly and toward the other agitating element, operating means for rotating said agitator elements in opposite directions, a shaft extending from said operating means freely through one of said elements to connection with the other thereof, to turn the latter, driving and beating arms connected to the operating means and extending to the ends of the blades of said element through which the shaft freely projects, said frame including at least three relatively fixed guard portions arranged adjacent to and outwardly of said driving and beating arms and relatively close thereto and enclosing said agitator elements, said arms being inclined outwardly and forwardly with respect to their path of rotation to draw material worked upon inwardly through said guard portions and to break up such material in cooperation with said guard portions.

JOHN R. SEARIGHT.