Nov. 7, 1939. F. RODWICK 2,179,383

WHIPPER

Filed March 3, 1939

FIG. 1.

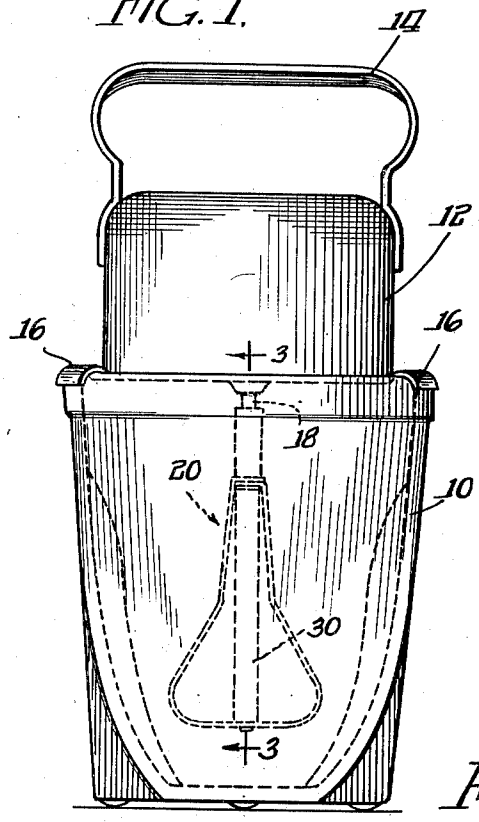


FIG. 2.

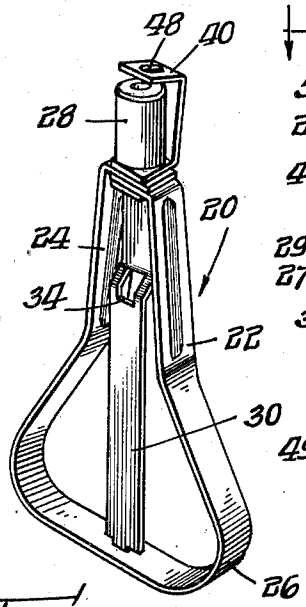


FIG. 3.

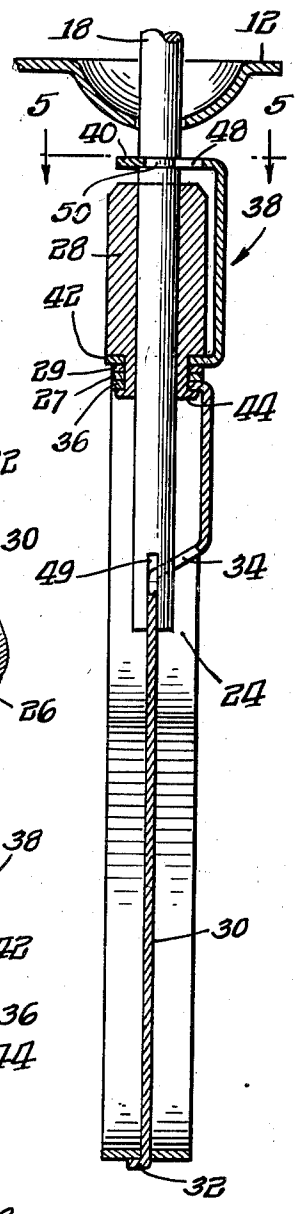


FIG. 4.

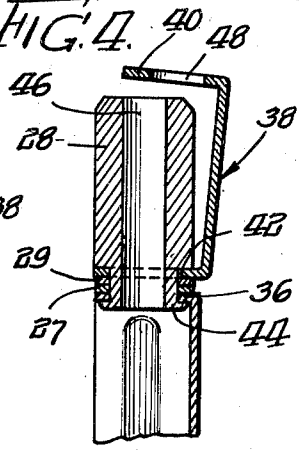


FIG. 6.

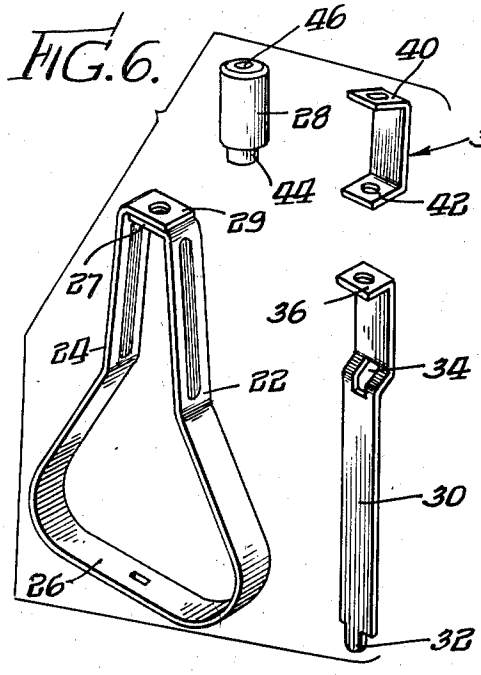
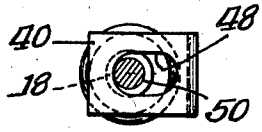


FIG. 5.



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UNITED STATES PATENT OFFICE

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WHIPPER

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Application March 3, 1939, Serial No. 259,583

12 Claims. (Cl. 259—134)

The present invention relates to a whipper or agitating device, and has more particular reference to a construction for facilitating the interconnection and separation of the parts of a whipping or beating device.

Yet more specifically, the present invention relates to an agitator, beater, or whipping member and its manner of juncture with a drive shaft. Constructions for whipping and beating foodstuffs, and which are operated by motive means such, for example, as an electric drive motor, necessarily are demountable, at least in so far as the beating instrumentality per se is concerned, since this member must be subjected to cleansing after use, a treatment which is not applicable to the associated control and drive means which is normally electrical in nature. Mechanical securing elements resorted to by those skilled in the mechanical arts are in general of no significance to the housewife, who is normally the ultimate user of devices of the present class, since they usually involve the employment of tools or other undesired mechanical manipulation.

It is accordingly within the contemplation of the present invention to provide an interconnecting means for a whipping member and a drive shaft which, while positively locking the parts in assembled position, nevertheless permits separation of the parts by a simple manipulating action involving a mere resilient pressure upon a yieldable member.

A particular object of the present invention is to provide a whipper coupling construction, as above, in which the parts are rotationally, firmly interlocked, while being engaged against axial displacement by a yieldable catch.

Other and further objects and advantages will more fully appear during the course and progress of the following specification, when considered in connection with the accompanying drawing, wherein:

Fig. 1 is an elevational view of a whipping device embodying the present invention;

Fig. 2 is a perspective view of the beating or whipping element per se;

Fig. 3 is a detail sectional view taken in the plane 3—3 of Fig. 1;

Fig. 4 is a detail sectional view through the upper end of the whipping element and taken in the same plane as Fig. 3, but showing the configuration of the parts when disassembled from the drive shaft;

Fig. 5 is a detail sectional view taken on the line 5—5 in Fig. 3; and

Fig. 6 is an exploded or disassembled view of the parts forming the whipping element, the parts being shown in perspective.

Referring to the figures of the drawing wherein the present invention is illustrated more in detail, Fig. 1 shows a construction comprising a beater bowl 10, upon which rests a motor housing 12 having a handle 14 and projecting curved lugs 16 engaging the upper edge of the bowl 10. A drive shaft 18 extends downwardly through the lower wall of the motor housing, as shown in Figs. 1 and 3, for actuating the whipping or agitating element per se. This latter element is shown in detail in the several figures and is designated by the reference numeral 20. In accordance with the present invention the whipping action is caused substantially entirely by a flat strip of material extending downwardly to provide arms 22 and 24, which arms are joined by a lower integral loop 26 extending laterally on either side of the arms.

The upper extremities of the arms 22 and 24 extend laterally and oppositely, as at 27 and 29, respectively, and overlap for securement to a bushing or sleeve 28, as will hereinafter appear more in detail.

A central stiffening and coupling member 30, similarly formed of sheet strip stock, extends axially upwardly of the beater unit, being fixed at its lower end by means of an integral tongue portion 32 extending through an aperture in the aforementioned loop portion 26 and being turned over, as clearly shown in Fig. 3. Attention is particularly directed to the fact that the axially extending strip 30 is provided intermediate of its length with a rectangular aperture 34, and the material of the strip is substantially offset at this point. In other words, the lower portion of the strip 30, as well as the lower edge of the aperture 34, is arranged in substantially exact alinement with the axis of the beater structure, whereas the upwardly extending portion adjacent and above the aperture is offset laterally so that the said lower edge of the aperture is freely accessible from an upper axial position for a purpose which will hereinafter appear in detail. The upper extremity of the strip 30 is laterally bent, as at 36, to lie adjacent the aforementioned laterally extending flanges 27 and 29, previously described.

The present whipper construction comprises an additional latching member 38, shown more in detail in Figs. 2 to 6, inclusive, and comprising a strip of resilient spring material having lateral flanges 40 and 42, respectively, at its upper and

lower extremities, extending in the same direction.

The several elements heretofore described are joined by means of the sleeve 28 which has a reduced portion 44 passing through alined apertures in each of the elements and upset or formed over to retain them in position. More specifically, each of the connecting flanges 27, 29, 36 and 42 are bored to receive the reduced portion 44 of the sleeve, and are nested thereon, as clearly shown in Figs. 2, 3 and 4, before peening the lower end of the reduced portion over to provide a rigid, unitary structure.

The central aperture 46 of the sleeve alines with the axially extending whipper element, and accordingly with the axis of the strip 30 and the lower edge of the rectangular aperture 34. The upper flange 40 of the resilient latch member 38 is similarly apertured, as at 48, but, as shown in Fig. 4, the formation of the latch member is such that this aperture 48 is normally resiliently retained out of alinement with the whipper axis. When, however, the yielding member 38 is resiliently urged to the left, as viewed in Fig. 4, it will be evident that the aperture 48 comes into alinement with the sleeve to accommodate the drive shaft 18.

Particular attention is directed to the fact that the drive shaft 18, at its lower end, is configurated with a transverse slot 49 which bifurcates the end of the shaft to permit engagement on both sides of the central strip 30 in the vicinity of the lower edge of the aperture 34 (see Fig. 3). It is obvious from this disclosure that when so arranged the whipper element is positively secured against relative rotational movement with respect to the shaft 18. In order to retain the whipper assembly rotationally upon the shaft 18, the latter element is provided with an annular groove 50 for receiving the latching element 38.

From the foregoing it will be apparent that the beater element is retained axially on the shaft by the engagement of the latching flange 40 in the annular groove 50. Removal of the whipper element from its shaft is rendered extremely simple by reason of the fact that it is merely necessary to displace the latching element resiliently to the left, as viewed in the figures, to aline its aperture 48 with the sleeve 38, whereupon the shaft may be axially withdrawn, at the same time carrying the bifurcated end of the shaft 18 away from engagement with the strip 30. Reassembly of the parts is carried out in a reverse manner to the above by properly alining the aperture 48 and inserting the shaft 18 through the sleeve 28 until the lower end of the shaft engages the central strip 30. At this point release of the latching member 38 engages the parts against axial movement.

The present invention provides a very simple, effective, and a releasable interlocking means for securing an instrumentality to a drive shaft, and is particularly useful in household appliances for employment by mechanically unskilled persons. The construction is free from any parts requiring adjustment or tightening to effect their usefulness, and provides a construction free from recesses of a character difficult to maintain in clean condition. The device, accordingly, contributes to the maintenance of sanitary conditions and is thus of importance in devices for whipping and agitating food-stuffs, while its convenience and facility of operation contribute to the continued functional existence of the driving motor by eliminating all necessity for bringing this latter member into the vicinity of washing liquid.

Numerous changes may be made in the form, construction, and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is claimed as follows:

1. Means for releasably and positively securing a driven element to a drive shaft and comprising drive shaft receiving means on said driven element, said driven element having a non-circular coupling means facing toward said shaft receiving means and in axial alinement therewith, the end of said drive shaft being provided with mating non-circular coupling means adapted to extend axially into engagement with said first named coupling means when the shaft is inserted axially of the shaft receiving means to prevent relative rotational movement between the shaft and the driven element, said drive shaft having a keeper conformation at a predetermined point along its length, and yieldable latch means mounted upon said driven element and extending axially therefrom toward said keeper receiving means, and releasably engageable with said keeper to retain the driven element in a predetermined axial position on the drive shaft.

2. In combination, a driven element and a drive shaft for said driven element, said driven element having a shaft embracing means movable axially and rotationally of the shaft, a strip of material extending in axial alinement with said shaft embracing portion and presenting a free edge portion facing toward said shaft embracing portion, said shaft having an end portion configurated with an edge receiving conformation and being adapted to engage said edge portion when the shaft is inserted through said shaft embracing portion, a yieldable latch member on said driven element, a recess formed at a predetermined axial position on said shaft for engagement by said latch means, said recess and latch means being positioned to interengage the parts against axial displacement when the shaft recess and strip are interengaged, whereby to positively interlock the parts against axial and rotational movement.

3. An agitator construction of the class described, comprising an agitator member having a drive shaft receiving sleeve, a shaft receiving member extending axially of said sleeve and having a portion in axial alinement with said sleeve, a second portion of said shaft receiving member between said alined portion and said sleeve being laterally offset, said shaft receiving member intermediate of said offset and axially alined portions being apertured to provide an edge portion in axial alinement with said sleeve and axially accessible to the end of a drive shaft inserted through said sleeve, said construction providing a portion engageable by a suitable interlocking configuration on the end of said drive shaft for locking the members together against relative rotation.

4. An agitator construction of the class described, comprising an agitator member having a drive shaft receiving sleeve and an elongated agitator means secured to said sleeve, a sheet member mounted between said sleeve and an opposed portion of said elongated means and having a portion arranged coaxially with said sleeve, said sheet member intermediate of said sleeve and

said coaxially arranged portion being laterally offset for permitting free access to said coaxial portion by the end of a drive shaft inserted through said sleeve, said sheet member being apertured adjacent the extremity of said coaxial portion to provide a free edge portion facing toward said sleeve and being adapted to be engaged by mating coupling means on a drive shaft to interlock the agitator against relative rotation.

5. An agitator construction of the class described, comprising an agitator member having a drive shaft receiving sleeve and an elongated agitator means secured to said sleeve, a bracing member mounted between said sleeve and an opposed portion of said elongated means and having a portion arranged substantially coaxially with said sleeve, said bracing member intermediate of said sleeve and said coaxially arranged portion being laterally offset for permitting free access to said coaxial portion by the end of a drive shaft inserted through said sleeve, said bracing member being apertured adjacent the extremity of said coaxial portion to provide a free edge portion facing toward said sleeve and being adapted to be engaged by mating coupling means on a drive shaft to interlock the agitator against relative rotation, and latch means extending generally axially of said sleeve and laterally yieldable for engaging said agitator against axial movement with respect to the shaft.

6. In a coupling means of the class described, a whipper or agitator comprising a shaft receiving sleeve, an elongated whipping bar mounted on said sleeve and extending therefrom, a strip sheet member secured at opposite extremities to said sleeve and said whipper for joining said elements and providing a rigid, durable agitator construction, a portion of said strip sheet member being in axial alinement with said sleeve, said strip sheet member intermediate of the sleeve and said axially alined portion being relieved to permit direct access to the axially alined portion of a shaft inserted through said sleeve.

7. In a coupling means of the class described, a whipper or agitator comprising a shaft receiving sleeve, elongated whipping means mounted on said sleeve and extending therefrom, a bracing member secured at opposite extremities to said sleeve and said elongated whipper member, a portion of said bracing member being in axial alinement with said sleeve, said bracing member intermediate of the sleeve and said axially alined portion being relieved and providing a full edge facing said sleeve to permit direct access to the axially alined portion of a shaft inserted through said sleeve, and a drive shaft for said whipper agitator adapted to be received by said sleeve and being formed adjacent its extremity with means for engaging said axially alined portion of the strip to interlock the parts against relative rotation.

8. In a coupling means of the class described, a driven member comprising a shaft receiving portion, elongated bar means mounted on said receiving portion and extending remotely therefrom, a strip bracing member secured at opposite extremities to said receiving portion and said elongated member for interengaging said members at opposed points to permanently rigidify the structure, a portion of said strip member being in axial alinement with said receiving portion, said strip member intermediate of the receiving portion and said axially alined portion being relieved to permit direct access to the axially alined portion of a shaft inserted through said receiving portion, a drive shaft for said driven member adapted to be received by said receiving portion and being formed adjacent its extremity with means for engaging said axially alined portion of the strip to interlock the parts against relative rotation, an axially extending, laterally yieldable latch member operatively associated with said receiving portion and having an apertured flange adapted to embrace said shaft, and keeper means located at a predetermined position longitudinally of said shaft for engagement by said flange to interlock the members against axial displacement.

9. In a coupling means of the class described, a driven member comprising a shaft receiving portion, elongated bar means mounted on said receiving portion and extending remotely therefrom, a strip bracing member secured at opposite extremities to said receiving portion and said elongated member for interengaging said members at opposed points to permanently rigidify the structure, a portion of said strip member being in axial alinement with said receiving portion, said strip member intermediate of the receiving portion and said axially alined portion being relieved to permit direct access to the axially alined portion of a shaft inserted through said receiving portion, a drive shaft for said driven member adapted to be received by said receiving portion and being formed adjacent its extremity with means for engaging said axially alined portion of the strip to interlock the parts against relative rotation, an axially extending, laterally yieldable latch member operatively associated with said receiving portion and having an apertured flange adapted to embrace said shaft, and keeper means located at a predetermined position longitudinally of said shaft for engagement by said flange to interlock the members against axial displacement, said yieldable member being laterally yieldably adjustable for disengagement from said shaft keeper means to permit disengagement of the driven member from the shaft.

10. An agitator construction for a whipper agitator device comprising a drive shaft receiving member adapted to embrace a drive shaft while movable axially and rotationally thereof, a whipper bar extending axially and laterally with respect to said shaft receiving member, a bracing member arranged between said shaft receiving member and a relatively remote portion of said bar member and interengaging said members for relatively rigidifying and bracing said whipper construction, said bracing member having a portion extending toward said shaft receiving member in general axial alinement therewith, and a portion between said first-named portion and said shaft receiving member laterally offset to provide ready access between said shaft receiving member and said first-named portion, said first-named portion providing a free edge facing substantially axially toward said shaft receiving member for making interlocking engagement with a shaft inserted through said member.

11. Means for releasably and positively securing a driven element to a drive shaft element and comprising a drive shaft receiving sleeve on said driven element, said driven element having a non-circular coupling means in axial alignment with said shaft receiving sleeve, said drive shaft element being receivable freely within said receiving sleeve and being provided with a mating non-circular coupling means adapted to extend axially into engagement with said first-named coupling means when the shaft is inserted axially

of the shaft receiving sleeve to prevent relative rotational movement between the shaft element and the driven element, one of said elements having a keeper conformation at a predetermined point along its length and yieldable latch means mounted on the other of said elements extending toward said keeper and positively engageable with said keeper to retain the driven element in predetermined axial position on the drive shaft.

12. Means for releasably and positively securing a driven element to a drive shaft element and comprising a drive shaft receiving sleeve on said driven element, said driven element having a non-circular coupling means in axial alignment with said shaft receiving sleeve, said drive shaft element being receivable freely within said receiving sleeve and being provided with a mating non-circular coupling means adapted to extend axially into engagement with said first-named coupling means when the shaft is inserted axially of the shaft receiving sleeve to prevent relative rotational movement between the shaft element and the driven element, one of said elements having a keeper conformation at a predetermined point along its length and yieldable latch means mounted on the other of said elements extending toward said keeper and positively engageable with said keeper to retain the driven element in predetermined axial position on the drive shaft, said keeper conformation comprising a recess formed in said shaft and said yieldable latch means comprising an apertured plate freely embracing said shaft and means normally urging said plate laterally with respect to the shaft to cause a peripheral portion of said aperture to be received within said recess when the recess and plate are axially aligned.

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