Aug. 27, 1957 G. E. KAUFMAN 2,804,290

MIXER SPINNER ASSEMBLY

Filed Sept. 10, 1954 2 Sheets-Sheet 1

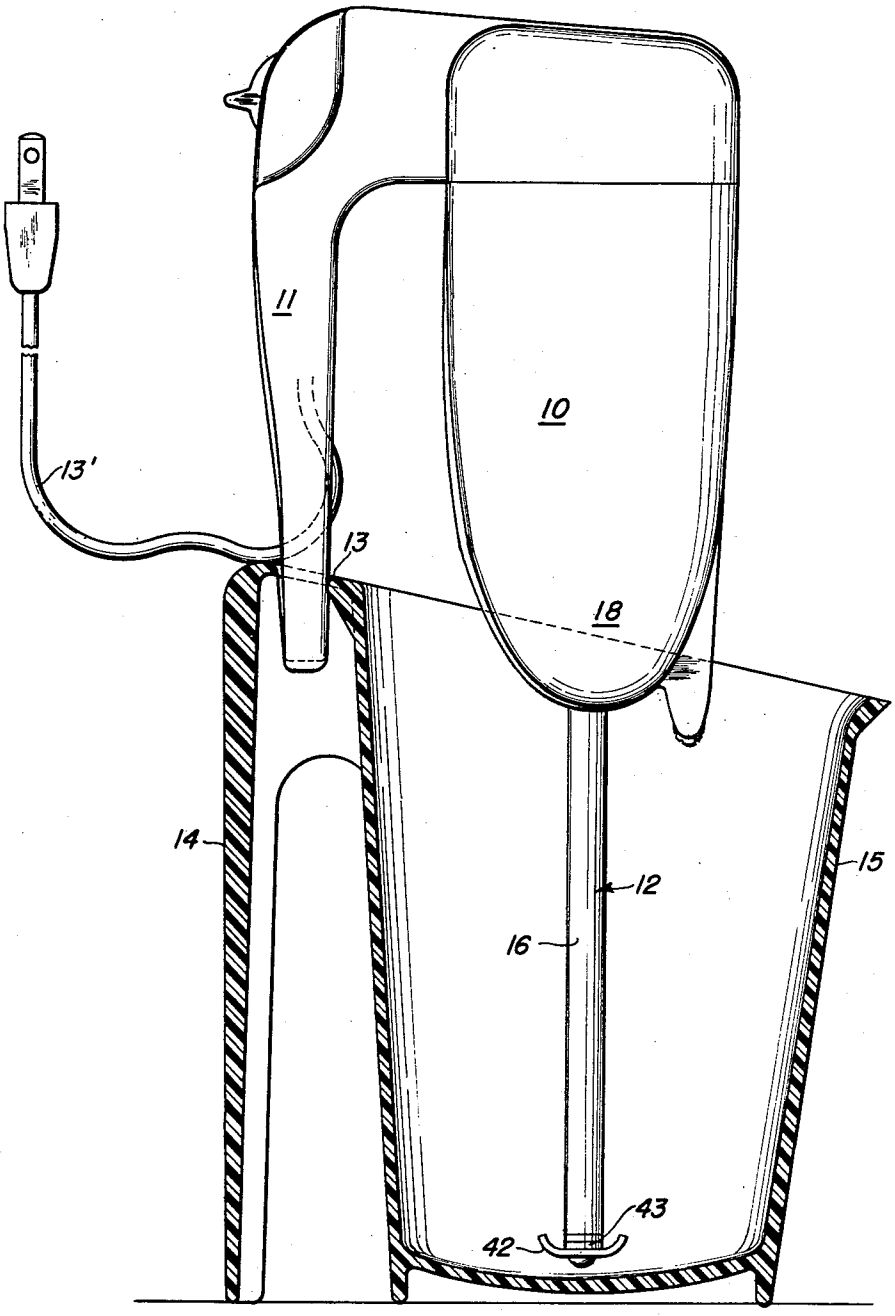

Fig. 1

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MIXER SPINNER ASSEMBLY

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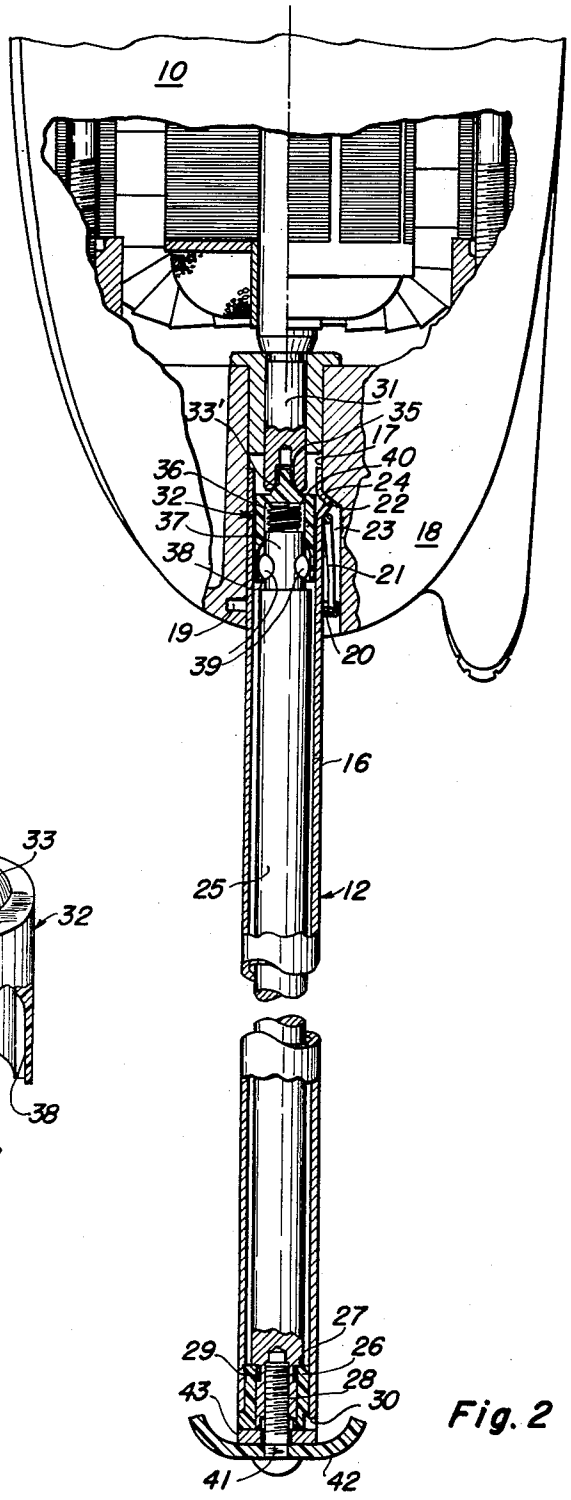

Fig. 2

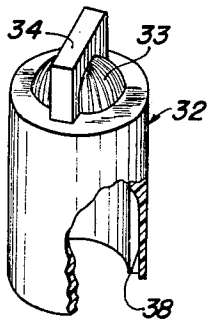

Fig. 3

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MIXER SPINNER ASSEMBLY

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The present invention relates to drink mixers and more particularly to a high-speed spinner mixer in which the spinner shaft is directly connected to the armature shaft of a multiple purpose portable mixer unit.

Where a spinner shaft is of the desired length and is directly connected to the high-speed armature shaft of such a portable unit, the lower end of the shaft has a tendency to whip i. e., the lower end of the mixer shaft, in addition to rotating about its own axis, also moves in the arc of a circle with the result that the mixer blade does likewise and thus does not perform its function properly.

The present invention overcomes that difficulty by providing a spinner assembly in which the spinner shaft proper rotates within a supporting tube or housing which prevents the lower end of the spinner shaft from whipping. The entire assembly is detachably connected to the mixer unit housing in a novel manner.

The suporting tube itself has a snap-on connection with a complementary socket in the power unit housing. The mixer shaft is detachably and drivingly connected to the armature shaft of the mixer unit by a driving connector which performs a number of novel functions. The connector is made of a frangible material preferably nylon, which will rupture or shear if the mixer blade should become tangled in clothing or otherwise stopped abruptly. It has a spherical portion which interfits with the centering hole in the armature shaft to make the assembly self-aligning. It has a cylindrical bore which is detachably and drivingly connected to the upper end of the spinner shaft so as to be easily replaceable. The cylindrical bore and spherical portion coact to make it unnecessary to have an upper bearing for the spinner shaft. The driving connector is spring biased away from the spinner shaft toward the armature shaft so that pressure is applied to the lower bearing for the spinner shaft to thus form a seal to prevent liquids from entering the supporting tube. The spinner connector has a lug which coacts with a kerf in the armature shaft and being spring biased away from the spinner shaft the lug will snap upwardly into the kerf when either shaft is rotated relative to the other. Thus, there is no need to align the lug and kerf when the spinner assembly is applied to the mixer unit.

At its lower end the spinner shaft is shouldered and enters the bore of a nylon bearing which thus forms a combined radial and thrust bearing as well as a running seal.

Other objects and advantages of the present invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

Fig. 1 is a side view of a portable mixer unit mounted on a mixing container showing how the spinner assembly of the present invention is used in practice,

Fig. 2 is a sectional view of the spinner assembly of the present invention shown attached to a mixer unit, and

Fig. 3 is a perspective view of the driving connector partly in section to show the internal construction.

Referring to Fig. 1 of the drawings a general purpose mixer unit is indicated by the reference numeral **10**. The unit **10** includes a handle **11** by which it may be carried about for ordinary mixing purposes and an electrical cord **13'** for connection to any suitable electrical outlet, any suitable switch being provided for energizing the unit.

The unit **10** is provided with the usual shaft outlets in the side of the casing opposite the handle **11** for driving a pair of food mixers for ordinary mixing operations. For use as a drink mixer, the unit is provided with the spinner assembly of the present invention, generally indicated by the reference numeral **12**. The end of the handle **11** is formed to fit into a socket **13** formed in the top of the handle **14** of a mixing cup **15** so as to support the unit **10** with the spinner assembly **12** extending vertically centrally of the cup **15**.

The spinner assembly **12** includes an outer tube **16**, the upper end of which is detachably connected in a socket **17** formed in the casing **18** of the unit **10**. The casing **18** is recessed at **19** to receive the lower transversely extending arms **20** of a latch **21**, the upper end of which fits beneath a protuberance **22** formed near the upper end of tube **16**. The casing **18** is recessed at **23** to receive the latch **21** and is provided with a shoulder **24** against which the protuberance **22** abuts to limit the movement of the assembly **12** into the socket **17**.

A spinner shaft **25** of a smaller outside diameter than the inside diameter of tube **16** is rotatably mounted within the tube **16** by means of a combined radial and thrust bearing **26**, the shaft **25** being shouldered at **27** so as to abut against the upper end of the bearing **26** and form a running seal between the bearing **26** and the spinner shaft **25**. The bearing **26** is preferably made of nylon, has a tight fit in the bore of the tube **16** and a running fit with the reduced portion **28** of shaft **25**, the reduced portion **28** being undercut at **29** to provide for the expansion of the material of the bearing. The bearing **26** is held in place by a tang **30** struck inwardly from the lower end of the wall of the tube **16**, the bearing being recessed as shown to receive the tang **30**.

At its upper end the shaft **25** is drivingly connected to the armature shaft **31** and supported centrally of the tube **16** by a driving connector generally indicated by the reference numeral **32** and shown per se in Fig. 3.

The connector **32** is provided with a spherical portion **33** which coacts with the center hole **33'** of the armature shaft **31** to render the assembly self-aligning and to center it within the tube **16**. A driving lug **34** on the upper end of the assembly **32** coacts with a kerf **35** in the shaft **31** to form a driving connection.

The body of the connector is of smaller outside diameter than the inside diameter of the tube **16** and is bored at **36** to fit a reduced portion **37** of the spinner shaft **25**. Outwardly extending recesses **38** are formed in the wall of the connector **32** and communicate with the bore **36** to coact with protuberances **39** formed on the reduced portion **37** of the spinner shaft **25** to form a driving connection between the connector **32** and the spinner shaft **25**. A spring **40** is housed within the bore **36** of the connector **32** to press the driving lug **34** upwardly into the kerf **35** and to press the spinner shaft **25** downwardly to engage the shoulder **27** with the upper end of bearing **36** and thus to form a running seal at the lower end of the assembly **12**.

The lower end of the spinner shaft **25** is internally threaded to receive a screw **41** which engages the lower face of a flexible spinner blade **42**, a washer **43** being interposed between the upper face of the blade **42** and the lower end of bearing **26**.

Assembly and disassembly

To assemble the spinner assembly **12** to the mixer power unit **10**, it is only necessary to place the end of the tube **16** into the socket **17** and press inwardly. The protuberance **22** will press the upper end of the latch **21** outwardly and permit the protuberance to engage the shoulder **24**. The upper end of the latch will drop behind the protuberance **22** to hold the assembly **12** in place.

If the lug **34** happens to be in alignment with the kerf **35**, the spring **40** will force the connector **32** inwardly so as to engage the lug **34** with the kerf **35** and press the spherical portion **33** into the center hole **33'** of shaft **31** to center the connector **32** and spinner shaft **25** within the tube **16**. The spring **40** will also press the shoulder **27** downwardly against the top of the bearing **26** to form a running seal.

If the lug **34** and kerf **35** happen to be out of alignment the spring **40** will be compressed. When either shaft is rotated relative to the other, the above engagement will take place automatically. Thus, it is not necessary for the operator to align the lug **34** and kerf **35** prior to assembling the assembly **12** into the socket **17**. The centering action of the connector **32** also renders it unnecessary to provide an upper bearing for the spinner shaft **25**.

If for any reason the spinner blade should become stalled or blocked, the lug **34** will snap off and no harm can be done. To replace such a broken connector, the assembly **12** is merely pulled from the socket **17**, the broken connector pulled out of the open end of the tube **16**, the spring **40** removed from the broken connector and placed in the bore **36** of a new connector **32** and the new connector slid over the reduced end **37** of shaft **25**, it being necessary to align the recesses **38** with the protuberances **39**.

From the foregoing it can be seen that this invention provides a spinner assembly which is easily attached to and detached from a portable mixer power unit, which prevents the free end of the spinner shaft from whipping, in which the spinner shaft is automatically aligned with the armature shaft and in which it is unnecessary to provide an upper bearing for the spinner shaft nor to provide a separate seal at the spinner end of the shaft.

While I have shown and described but a single embodiment of my invention, it is to be understood that that embodiment is to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the specific structure shown and described but wish to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. In combination: a portable mixer power unit including a casing; a socket formed in said casing, an armature shaft extending into said socket; a spinner unit; said spinner unit including a supporting tube having one end extending into said socket, a spinner shaft of smaller outside diameter than the inside diameter of said tube rotatably mounted within said tube, a bearing at the lower end of said tube for rotatably supporting the lower end of said shaft within the lower end of said tube, the upper end of said shaft being out of contact with the interior of said tube and free to move sideward therein when said spinner unit is not attached to said power unit, and a spinner blade attached to the lower end of said spinner shaft; and a replaceable driving connector detachably connected to the upper end of said spinner shaft and coacting with said power shaft and said spinner shaft for drivingly connecting them; means for detachably securing the upper end of said tube within said socket and centering means on the upper end of said driving connector coacting with complemental centering means on the lower end of said armature shaft for centering said connector and spinner shaft within the upper end of said tube.

2. A spinner unit for detachable connection to a portable mixer power unit comprising, a stationary supporting tube for detachable connection to the casing of said power unit, a spinner shaft of smaller outside diameter than the inside diameter of said tube rotatably mounted within said tube, a bearing at the lower end of said tube for rotatably supporting the lower end of said spinner shaft, the upper end of said spinner shaft being unsupported radially of said tube and free to move laterally therein when said spinner unit is unattached to said power unit, a driving connector detachably and drivingly connected to the upper end of said spinner shaft and also free to move laterally in said tube when said spinner unit is unattached to said power unit, said driving connector having centering means on its upper end for coaction with complemental centering means on the power shaft of said power unit when said spinner unit is attached thereto and operable to center said spinner shaft and driving connector within the upper end of said tube when said spinner unit is attached to said power unit, said driving connector also having driving means formed on its upper end for coaction with complemental driving means on said armature shaft when said spinner unit is attached to said power unit, and a spinner blade attached to the lower end of said spinner shaft so as to be rotatable therewith.

3. A driving connector for detachably and drivingly connecting the spinner shaft of a spinner unit to the shaft of a mixer power unit and for centering the spinner shaft within the casing of the spinner unit when the spinner unit is attached to said power unit comprising, a generally cylindrical body having a bore in its lower end for slidably receiving the upper end of said spinner shaft and holding the same free of the casing of said spinner unit when the latter is attached to said power unit, recesses formed in the interior walls of said connector and opening into said bore for receiving protuberances on the end of said spinner shaft for drivingly connecting said connector to said spinner shaft, the upper end of said connector being formed with a spherical portion for coaction with a complemental spherical portion on the lower end of said power shaft for centering said connector and said spinner shaft with respect to the casing of said spinner unit and with a driving lug extending across and beyond said spherical portion for coaction with complemental driving means on the lower end of said power shaft for drivingly connecting said connector to said power shaft.

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