April 30, 1935. C. HARTUNG 1,999,564

STIRRER DEVICE

Filed March 15, 1933 2 Sheets-Sheet 1

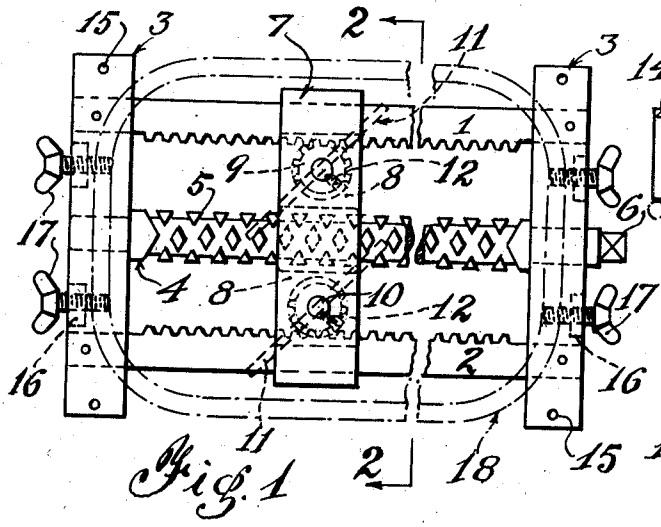


Fig. 1

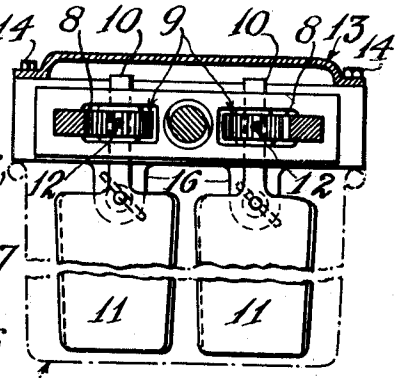


Fig. 2

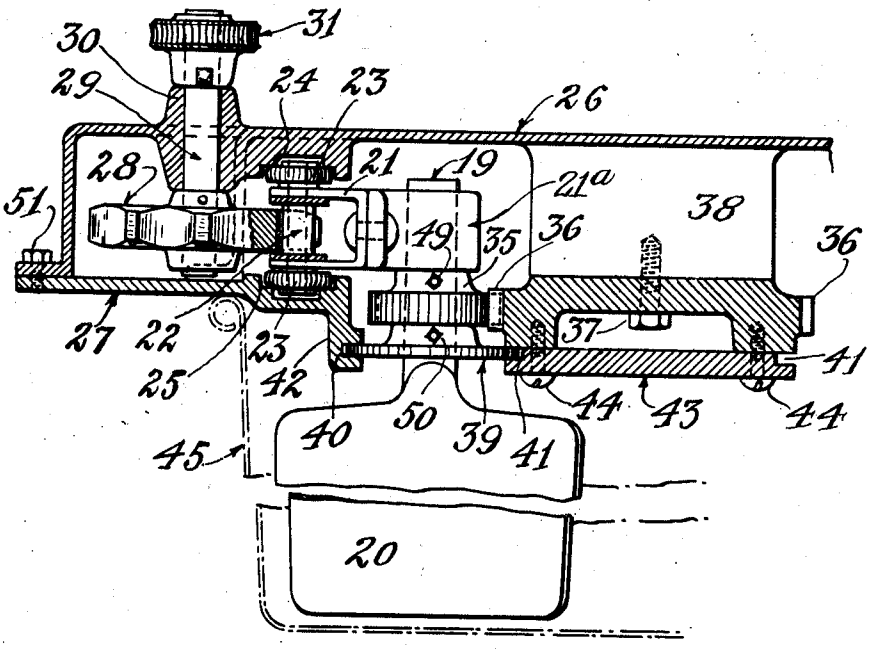


Fig. 5

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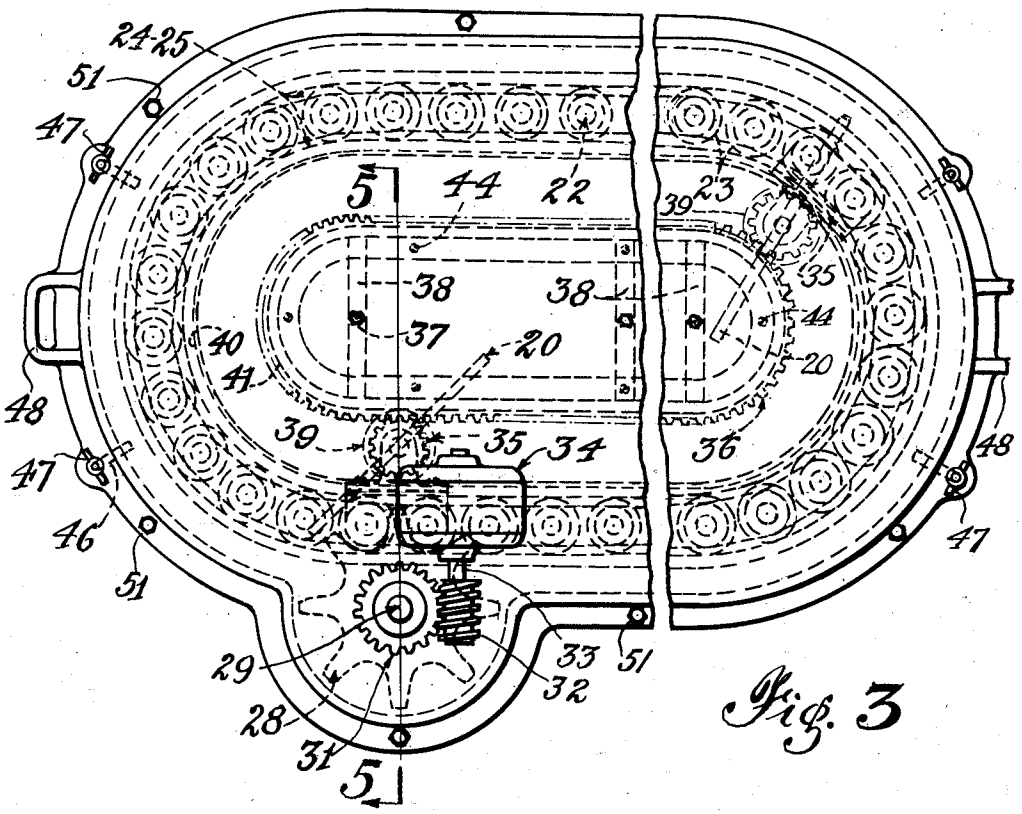


Fig. 3

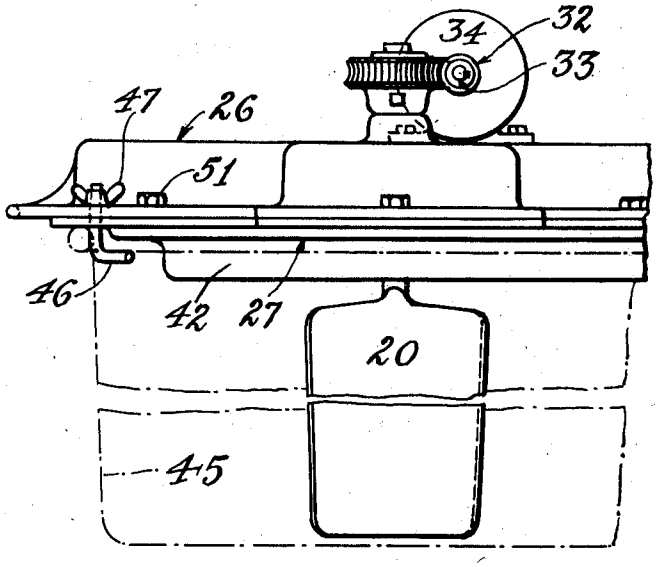


Fig. 4

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1,999,564

STIRRER DEVICE

Corda Hartung, Lansdowne, Pa.

Application March 15, 1933, Serial No. 660,809

4 Claims. (Cl. 259—102)

This invention relates to agitators or stirrers, and more in particular to stirrers for fluids to be used inside of electrically operated refrigerator-boxes for the preparation of ice-creams, sherbets, frozen desserts, and the like.

One of the primary objects of this invention is to provide a, preferably, power driven stirrer adapted for use within a refrigerator-box, whereby the liquid and solid ingredients used for making ice-creams, sherbets, frozen desserts, etc. may be properly mixed and slowly agitated to produce such foods of very fine texture and to prevent crystallization during the process of congelation.

Another object of this invention is to provide such a stirrer device which will be effective substantially at all points of the liquid mixture to be agitated and which can be operated as long as required without personal attention.

Still another object of this invention is the provision of such a stirrer device which is sanitary, which can be easily cleaned and which is simple and positive in its operation.

Additional features and advantages of this invention will appear in the course of the following description considered in connection with the accompanying drawings forming part of this application.

In the drawings:

Fig. 1 is a fragmentary top plan view of a stirrer device of the reciprocating type, the cover therefor being removed and the container for the food mixture being shown in dot and dash lines.

Fig. 2 is a cross-sectional view taken substantially on line 2—2, in Fig. 1.

Fig. 3 represents the top plan view of a modified embodiment of my invention.

Fig. 4 is a fragmentary side elevation of Fig. 3.

Fig. 5 is a fragmentary cross-sectional view taken substantially on line 5—5, Fig. 3.

Reference being had to the drawings, the stirrer device illustrated in Figs. 1 and 2 comprises two rack-members 1 and 2 held together in suitable spaced parallel relation by means of the end-bars 3. Rotatably mounted therein, and parallel to the rack-members, is the spindle 4, having reverse-threads 5 and provided at one end with a square shank 6, or any other desired and suitable means, for connection, preferably, to an electric motor (not shown).

Slidably supported by the rack-members is the cross-head 7 centrally threaded to cooperate with the reverse-threads 5 and provided with apertures 8 each slidably engaging three sides of a rack-member and also receiving the rack-pinions 9 adapted to accommodate the cylindrical shanks 10 of the stirrers 11. These shanks serve, in the present embodiment, as journals for the pinions and are rotatably supported in the cross-head. Screws 12 are shown as one means for securing the shanks 10 for vertical adjustment within said pinions.

If desired, a cover 13, secured by screws 14 engaging holes 15, may be incorporated in the device, to prevent water or foreign matter dropping into the food-mixture. Lugs 16, positioned on the end-bars 3 and engaged by wing-screws 17, show one of many available methods for removably securing the stirrer device to the container or pan 18 for the food-mixture.

As will be readily understood, the rotation of the spindle 4 will cause the cross-head to move in one direction and upon the former reaching either end of the reverse-threads will be caused to move in the opposite direction, without requiring any reversal of the sense of rotation of the spindle.

In the modified construction shown in Figs. 3 to 5, the stirrer is caused to rotate about its vertical axis while moving along a, preferably, oblong endless path having semi-circular portions joined together by tangential straight portions.

In this construction, the shank 19 of the stirrer 20 is rotatably mounted in a bearing 21 secured to a special, U-shaped, link 21a on the endless roller-chain 22. The latter is guided in its orbital path by means of anti-friction rollers 23 adapted to run in the upper and lower endless channels 24 and 25 provided respectively in the cover 26 and the base 27, which parts when secured together by screws 51 form the housing of the device.

The roller-chain is moved along its non-circular orbital path by means of a sprocket-wheel 28 secured at the lower end of the vertical shaft 29, rotatably mounted in a bearing 30 provided in the cover. At the upper end of this shaft is secured a worm-gear 31 meshing with a worm 32 provided on the shaft 33 of the electric motor 34 bolted on the cover.

The rotation of the stirrer about its own axis is effected by securing on the shank 19 a gear-pinion 35 meshing with a centrally disposed endless rack 36, the semi-circular ends of which are properly dimensioned to cooperate with the guide-channels 24 and 25, and are concentric therewith. This rack is secured to the cover 26 by means of screws 37 driven into the depending lugs 38.

To properly guide the stirrer and insure a good

meshing engagement of the pinion **35** with the rack **36**, a guide-disc **39** is mounted on the shank **19**, below the pinion, said disc being rotatably guided in two opposite and parallel grooves **40** and **41**. Groove **40** is cut directly in a depending endless rib **42** cast on the base **27**, whereas the groove **41** is rabbeted in a plate **43** secured to the rack-member by screws **44**.

The complete device may be removably secured to the container **45** for the food-mixture in any desired manner, and in Figs. 3 and 4 clamping bolts **46** adapted to engage the rim of the container and having wing-nuts **47** have been suggested for this purpose. To facilitate handling of the device, grips **48** may be cast on the cover, as shown.

If desired and as suggested in Fig. 3, two or more stirrers **20** of suitable size may be mounted in the same manner as above described, to accentuate and expedite the agitation of the food mixture.

The motion of the endless roller-chain in its prescribed path entraining the stirrer causes the latter to rotate about its vertical axis, owing to the gear pinion **35** meshing with the stationary endless rack **36**. Thus, by referring to Fig. 3 in particular, it will be readily seen that if the endless roller-chain is driven in a clockwise sense, the stirrer will be rotated in the same sense; whereas the reversed motion of the roller-chain will cause a counter-clockwise rotation of the stirrer about its axis. The width of the stirrer is made preferably substantially equal to one-half the width of the container and the ends of the latter are made semi-circular, so that all parts of the liquid mixture will be thoroughly agitated by the stirrer.

Limited vertical adjustment of the stirrer, to suit the depth of the container, may be obtained by means of the screws **49** and **50** used respectively to removably secure the stirrer-shank **19** to the pinion **35** and the guide-disc **39**, as will be readily understood.

As stated heretofore, the device is especially intended to be used in combination with electrically operated refrigerator-boxes for domestic use, and it will be suitably dimensioned to permit of its insertion inside the cooling unit of the refrigerator (not shown), where ice-cubes are now frozen.

It will be understood, of course, that the arrangements I have herein shown and described are merely suggestive of many that might be adopted in carrying out my invention, and I do not wish to be limited to the constructions illustrated otherwise than as specified in the appended claims.

I claim:

1. In a stirrer device, an endless chain; a bearing element mounted thereon; guide-means to direct the chain for travel in an orbital path; a stirrer; a shank therefor rotatable in said bearing element; a stationary rack co-axially disposed with said guide-means and parallel thereto; a gear positioned on said shank and in meshing engagement with said rack; a guide-disc positioned on said shank and adapted to move in endless grooves concentrically and parallelly disposed with the guide-means of said chain, and power means to actuate said chain.

2. In a stirrer device, an endless chain having at least one U-shaped link; a bearing element mounted thereon; stationary guide-means to direct the chain for travel in an orbital path; a stirrer; a shank therefor rotatable in said bearing element; a stationary rack co-axially disposed with said guide-means and parallel thereto; a gear positioned on said shank and in meshing engagement with said rack; a guide-disc positioned on said shank intermediate said gear and stirrer and adapted to move in endless grooves concentrically and parallelly disposed with the guide-means of said chain, and means to actuate said chain.

3. In a stirrer device, a casing comprising a cover and a base; an endless chain; a bearing element mounted thereon; dual guide-means positioned in superposed relation in said cover and base to direct the chain for travel in an orbital path; a stirrer; a shank therefor rotatable in said bearing element; a stationary rack on said cover co-axially disposed with said guide-means and parallel thereto; a gear positioned on said shank and in meshing engagement with said rack; a guide-disc positioned on said shank and adapted to move in endless grooves concentrically and parallelly disposed with the guide-means of said chain; a sprocket rotatably mounted on said cover and adapted to actuate said chain, and means to rotate said sprocket.

4. In a stirrer device, a casing comprising a cover and a base; an endless chain; a bearing element mounted thereon; dual guide-means positioned in superposed relation in said cover and base to direct the chain for travel in an orbital path; a stirrer; a shank therefor rotatable in said bearing element; a stationary rack on said cover co-axially disposed with said guide-means and parallel thereto; a gear positioned on said shank and in meshing engagement with said rack; means to adjustably secure the gear on said shank; a guide-disc positioned on said shank and adapted to move in endless grooves concentrically and parallelly disposed with the guide-means of said chain; means to adjustably secure this guide-disc on said shank; a sprocket rotatably mounted on said cover and adapted to actuate said chain, and power means to rotate said sprocket.

CORDA HARTUNG.