

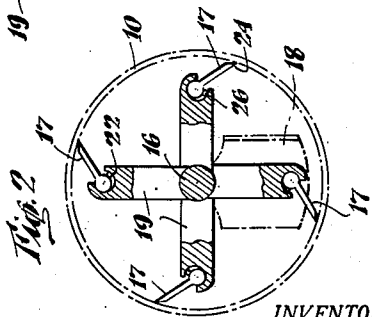
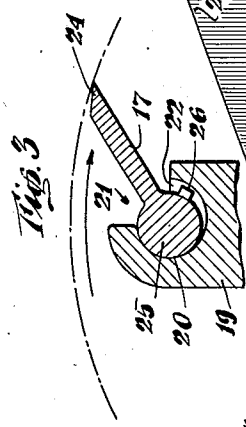
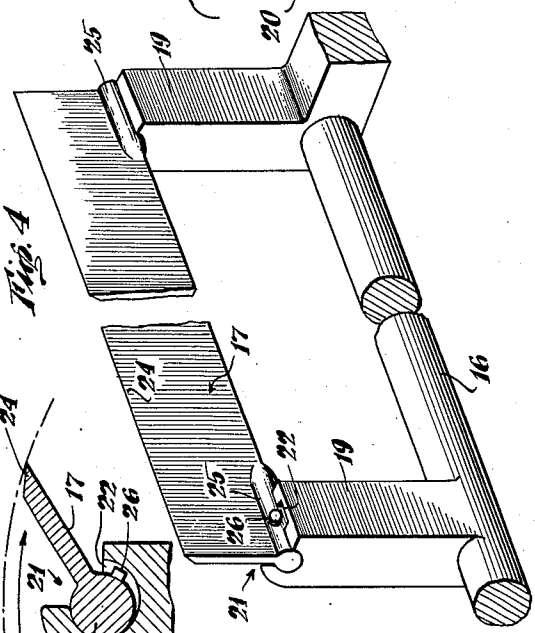
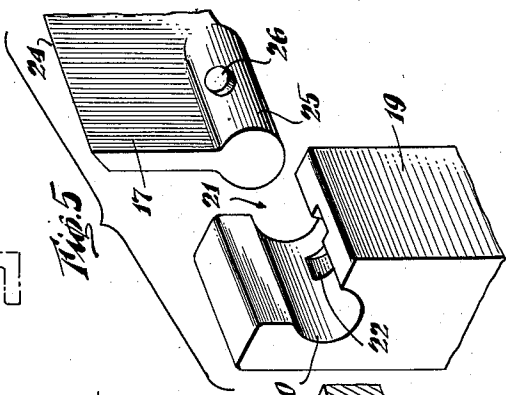
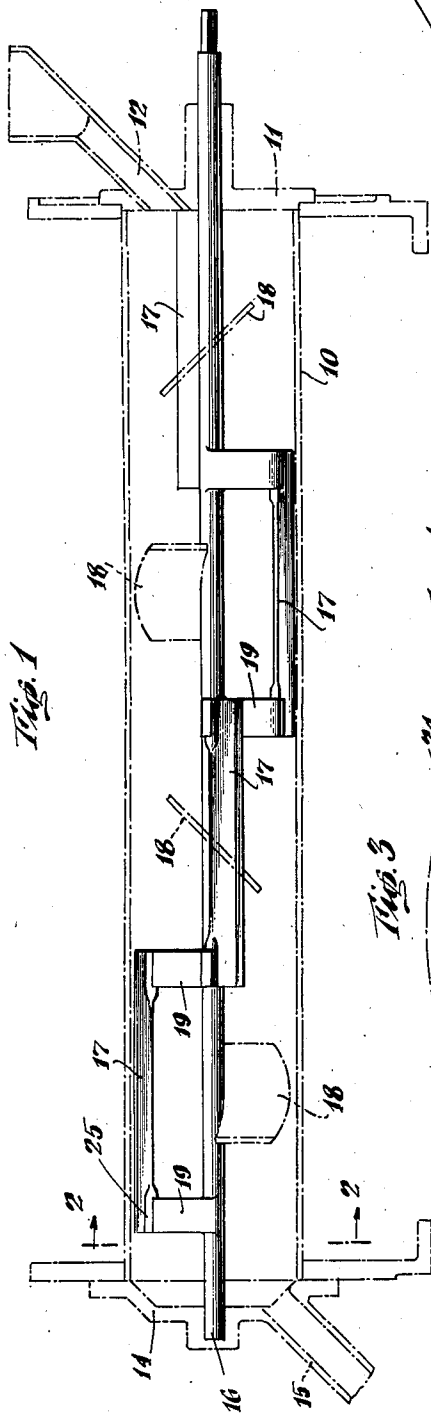
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C. KALTENBACH ET AL.

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AGITATOR

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INVENTORS
Carl Kaltenbach
Ludwig Schmitt
BY *Les C. Krazinski*
ATTORNEY

UNITED STATES PATENT OFFICE

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AGITATOR

Carl Kaltenbach and Ludwig Schmitt,
Bronx, N. Y.

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The present invention relates to agitators and, more particularly, relates to an agitator for use in connection with apparatus of the type for continuously congealing frozen confections, such as ice creams, custards, sherbets, and the like, the agitator including blades for scraping the confection from the inner cylindrical side wall of the freezing cylinder to which the confection has been caused to adhere, and being an improvement over the agitator disclosed in our prior United States Letters Patent No. 2,188,551 of January 30, 1940.

Apparatus of the foregoing type are subject to rigid inspection by health authorities of many localities and must comply with the health regulations of such localities. In order to be approved, the apparatus must be adapted for thorough and absolutely reliable cleaning including the blades of the agitator which usually is facilitated by removably mounting the blades on the rotor or shaft of the agitator.

In so mounting the blades, it is essential that the blades be easily detached and yet be reliably connected to prevent accidental detachment or displacement when in use. It is also essential, if not of prime importance, that the means for connecting the blades be adapted for thorough cleaning and also be constructed and arranged as to facilitate inspection thereof.

Accordingly, an object of the present invention is to provide an improved agitator of the character described herein wherein the blade connecting means are constructed and arranged to comply with the foregoing requirements.

Another object is to provide such connecting means which are rugged and durable in construction and which can withstand such rough usage to which they may be subjected.

A further object is to provide such connecting means which comprise simple and practical elements adapted to be formed in an economical manner.

Other and further objects will be obvious upon an understanding of the illustrative embodiments about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the invention, the foregoing objects are accomplished by providing an agitator comprising a shaft or rotor, pairs of outwardly extending arms on the shaft each having at its free end a cylindrical bore parallel to the shaft provided with an open side section, a scraper blade for each pair of arms having cylindrical formations pivotally mounted in each bore, and

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pin and groove means associated with at least one bore and one formation of each pair of arms for locking the blades against axial movement with respect to the bores and the shaft.

In the preferred embodiment of the invention about to be described in detail, one bore of each pair of arms has an arcuate groove between the ends thereof commencing at one end of the open section and, if desired, being of diminishing depth in a circumferential direction away from the open section; and one formation of each blade has a pin adapted to be disposed in the groove.

A preferred embodiment of the invention has been chosen for purposes of illustration and description as is shown in the accompanying drawing, forming a part of the specification, wherein—

Fig. 1 is a side elevational view of an agitator, the elements embodying the present invention being shown in full lines and the conventional prior art structure being shown in broken lines.

Fig. 2 is a sectional view taken along the line 2—2 on Fig. 1 in the direction of the arrows.

Fig. 3 is an enlarged fragmentary sectional view illustrating the connecting means in blade locking position.

Fig. 4 is a fragmentary perspective view illustrating the blades positioned for removal from the arms.

Fig. 5 is an enlarged fragmentary exploded perspective view illustrating a portion of the blade disconnected from an arm.

Referring to the drawing in detail and more particularly to Figs. 1 and 2 thereof, there is shown apparatus for congealing frozen confections which comprises a cylinder 10 in which the confection is frozen by applying a refrigerating or cooling medium to the outer walls of the cylinder by means of a heat exchanger (not shown), a closure 11 for one end of the cylinder having an inlet 12 through which the mix used in making the confection is introduced, a closure 14 for the other end of the cylinder having an outlet 15 for removing the frozen confection from the cylinder, and a shaft or rotor 16 rotatably mounted between the closures and carrying blades 17 for scraping the congealed or frozen confection from the inner walls of the cylinder and elements 18 for directing the frozen confection towards the outlet.

As shown herein by way of example, the shaft has four pairs of spaced apart radially outwardly extending arms 19 progressively disposed at an angle of ninety degrees to each other, each pair of arms serving to support a blade 17, as about to be described.

Referring more particularly to Figs. 3, 4, and 5,

which illustrate the invention in detail, the arms 19 are shown formed with a cylindrical through bore 20 parallel to the shaft 16, which bore is provided with an open or cut-away side section 21 of about ninety degrees. One bore of each pair of arms has an arcuate groove or slot 22 between its ends commencing at one end of the open section and diminishing in depth in a circumferential direction away from the open section (Fig. 3).

Each blade 17 has a lengthwise extending scraping edge 24 at one side thereof and a pair of cylindrical formations 25 at the other side thereof adapted to be pivotally mounted in the bores 20 in the manner described hereinafter. One formation 25 of each blade has a radially extending pin 26 thereon disposed at an angle, slightly less than ninety degrees with respect to the blade section proper, which pin is adapted to be positioned in the groove 22 to lock the blade against axial movement in the bore but which facilitates assembly and detachment of the blades 17 from the arms 19.

In order to assemble the blades 17 on the arms 19, a blade section proper is aligned with its pair of arms with its scraping edge facing outwardly of the free ends of the arms and its formations 25 in axial alignment with and to the side of the bores 22, as shown in Fig. 5. The formations are then slid axially into the bores with the pin 26 passing through the open section 21 to a position whereby the pin is in alignment with the groove 22, as shown in Fig. 4. The blade formations thereafter are rotated in the bores so that the pin enters the groove. If desired, slight pressure is applied on the blade to effect frictional engagement between the end of the pin and a portion of diminished depth of the groove, whereby accidental separation of the blades from the arms is prevented prior to mounting the shaft in the cylinder 18.

When the shaft is mounted in the cylinder and is rotated, centrifugal force and the mass of confection in the cylinder swing the blades outwardly to the position shown in Fig. 3 with edge 24 in scraping relation with the inner wall of the cylinder. Removal of the blades is readily effected by following the foregoing procedure in reverse order.

From the foregoing description, it will be seen that the present invention provides an improved agitator structure wherein the blades are readily locked in position during operation of the apparatus. It is to be noted also that the pivotal mounting insures a self-sharpening action on the edge 24 of the blade. The locking elements are simple and practical, facilitate easy assembly and detachment of the blades and have surfaces which lend themselves to thorough cleaning in a convenient manner.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matters are to be interpreted as illustrative and not in any limiting sense.

What is claimed is:

1. An agitator for apparatus of the class described comprising a shaft, a pair of outwardly

extending arms on said shaft each having at its free end a cylindrical bore parallel to said shaft provided with an open side section, a scraper blade having a cylindrical formation pivotally mounted in each bore, and pin and groove means associated with one of said bores and one of said formations for locking said blade against axial movement with respect to said bores, said groove means being transverse to the longitudinal axis of said shaft.

2. An agitator for apparatus of the class described comprising a shaft, a pair of outwardly extending arms on said shaft each having at its free end a cylindrical bore parallel to said shaft provided with an open side section, one of said bores having an arcuate groove between the ends thereof commencing at one end of the open section, a scraper blade having a cylindrical formation pivotally mounted in each bore, and a pin on one of said formations disposed in said groove for locking said blade against axial movement with respect to said bores.

3. An agitator for apparatus of the class described comprising a shaft, a pair of outwardly extending arms on said shaft each having at its free end a cylindrical bore parallel to said shaft provided with an open side section, one of said bores having an arcuate groove between the ends thereof commencing at one end of the open section and diminishing in depth in a circumferential direction away from the open section, a scraper blade having a cylindrical formation pivotally mounted in each bore, and a pin on one of said formations disposed in said groove for locking said blade against axial movement with respect to said bores.

4. An agitator for apparatus of the class described comprising a shaft, a pair of outwardly extending arms on said shaft each having at its free end a cylindrical bore parallel to said shaft provided with an open side section of about ninety degrees, one of said bores having an arcuate groove between the ends thereof commencing at one end of the open section and diminishing in depth in a circumferential direction for about ninety degrees away from the open section, a scraper blade having a blade section and a cylindrical formation pivotally mounted in each of said bores, and a pin on one of said formations disposed in said groove and disposed at an angle slightly less than ninety degrees with respect to said blade section for locking said blade against axial movement with respect to said bores.

CARL KALTENBACH.
LUDWIG SCHMITT.

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