Sept. 17, 1929. S. BRAMSEN ET AL 1,728,658

DETACHABLE DRIVE FOR AGITATORS

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Fig. 1

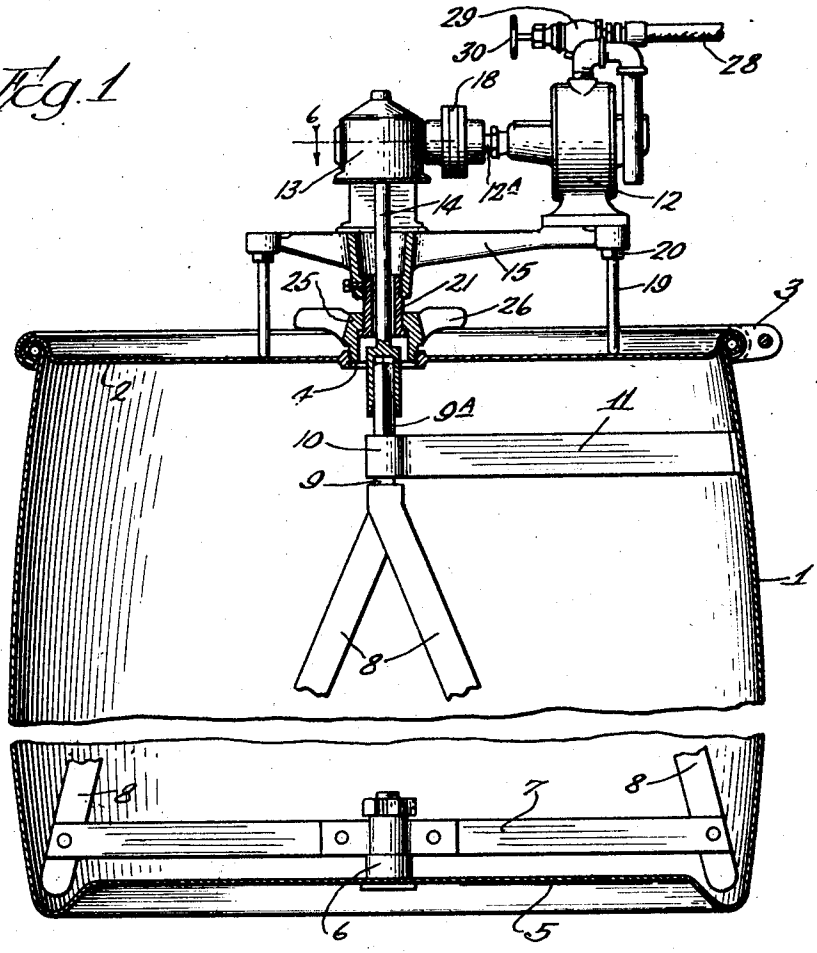
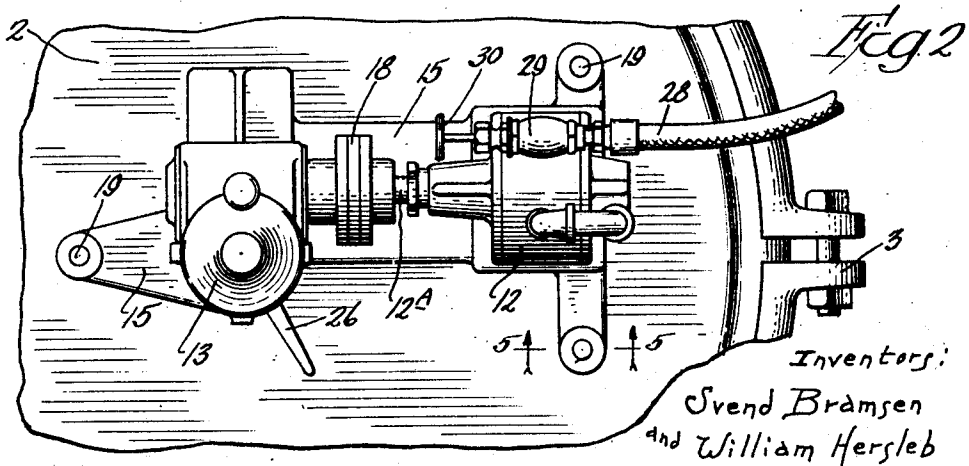


Fig 2



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Fig. 3

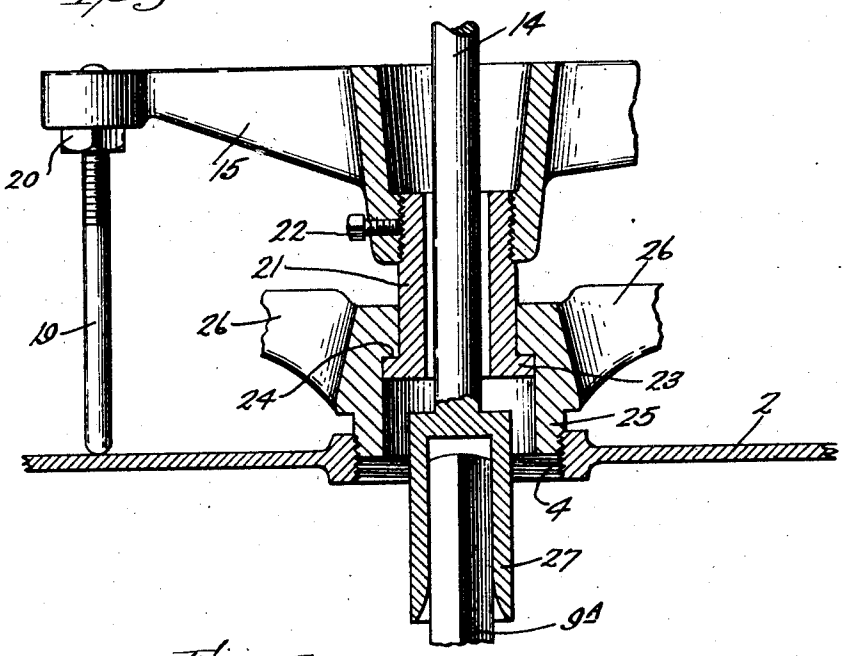


Fig. 4

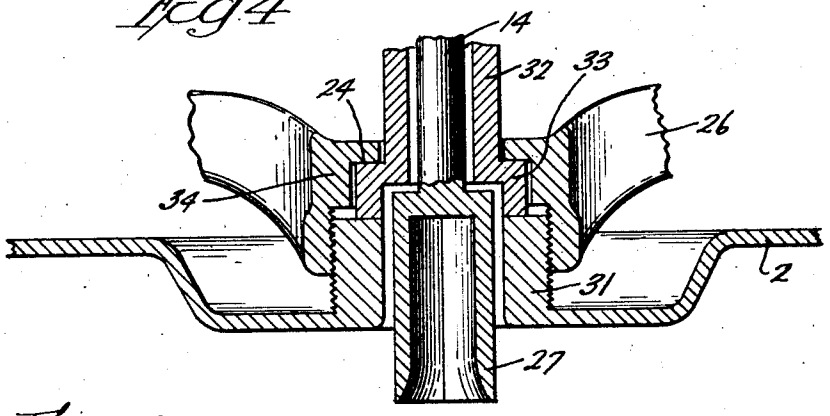
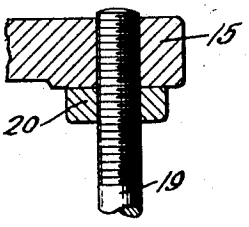


Fig. 5



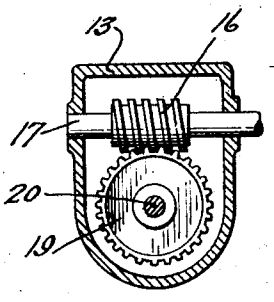


Fig. 6

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UNITED STATES PATENT OFFICE

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DETACHABLE DRIVE FOR AGITATORS

Application filed December 17, 1927. Serial No. 240,338.

Our invention relates to portable means for rotating agitators or stirrers in containers, and in its general objects includes the providing of driving means which can readily be attached to, and detached from, such containers and which can easily be adjusted to allow for variations in the containers.

With many varieties of liquid coating materials, some of the heavier constituents gradually separate from the lighter ones and descend to the bottom of the container, so that the material needs to be thoroughly stirred before it is used. This is particularly true where the liquid is to be applied by means of a spraying device, as a lack of uniformity in the liquid will produce a spotty appearance on the sprayed object and may also clog passages in the spray appliances. To allow for this, such liquid coating materials are commonly shipped in steel containers in each of which a suitable agitator is rotatably mounted, and the agitator has a shaft-end accessible through an aperture in the cover of the container.

Heretofore, the agitators in such containers have been rotated by manually operated cranks, which requires a good deal of power for initially stirring up the thickened lower portion of the liquid and also consumes considerable time. Since a suitable supply of compressed air is usually available for forcing the liquid out of the container and for spraying it, this slow and tiresome labor could be saved, and our present invention aims to accomplish this both expeditiously and economically.

For this purpose, our invention aims to provide a power unit adapted for convenient and firm attachment to the cover of a container and for interengagement with the shaft of the agitator within the container, which power unit will include both a prime mover (such as an air-driven motor) and a reducing gear. It also aims to provide simple means for quickly and firmly securing such a power unit to the container, for steadying the power unit over a considerable area. Moreover, it provides suitable adjustments to allow for variations in the disposition of interengaging parts on the container and the power unit.

Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which:

Fig. 1 is a central and vertical section through a container having an agitator rotatably mounted in it and through an agitator-rotating unit embodying our invention, with portions of the container and agitator broken away.

Fig. 2 is an enlarged plan view of the agitator-rotating unit and of the adjacent portion of the cover of the container.

Fig. 3 is an enlargement of a portion of Fig. 1.

Fig. 4 is a sectional view similar to a portion of Fig. 3, but showing a clamping arrangement suitable for use with a container cover provided with a male threaded nipple.

Fig. 5 is a fragmentary and enlarged vertical section taken along the line 5—5 of Fig. 2.

Fig. 6 is a fragmentary and enlarged horizontal section taken along the line 6—6 of Fig. 1 to show the reducing gear interposed between the horizontal motor shaft and the vertical operating shaft.

In the drawings, Fig. 1 shows a container comprising a barrel 1 having a cover 2 clamped to its upper end by a clamping ring 3, this cover having a central and threaded nipple 4 which is closed by a suitable plug when the container is shipped, and the threading of which nipple also affords simple means for attaching the usual connections to the spray apparatus. Secured to the bottom 5 of the container is an upwardly projecting stud 6 about which the lower horizontal bar 7 of the agitator is rotatable, which also has a portion supporting the agitator. Secured to the ends of the bar 7 are a pair of agitator strips 8 which converge upwardly and are secured to a vertical agitator shaft 9. This shaft extends through a journal 10 on the end of a bracket 11 secured to the barrel, and the shaft has a square-sectioned upper end 9A extending close to the cover and substantially in axial alinement with the cover perforation 4.

For rotating the agitator shaft we provide a portable unit which includes in rigid assembly an air motor 12, a speed-reducing mecha-

nism 13 operatively connected to the motor and having a vertical depending shaft 14, and a base 15 supporting both the motor and the speed-reducing mechanism. Illustrative of a suitable mechanism for reducing the speed and for transmitting the power from the horizontal shaft 12A of the motor, Fig. 6 shows a worm 16 on a transmission shaft 17 connected to the motor shaft by a flexible coupling 18, which worm meshes with a worm wheel 19 secured to the upper end of the vertical actuating shaft 14.

Extending downwardly from the base are three legs 19, each of which is threaded through the base or support 15, so that the legs are independently in their effective heights, each of which legs can be locked in its adjusted position by a locknut 20. Depending from the support 15 and surrounding a part of the vertical actuating shaft 14 above the top of the barrel is a collar 21, here shown as threaded into the base and locked against rotation by a set screw 22, which collar has a radial flange 23 at its lower end. This flange is overhung by an annular shoulder 24 in the bore of an attaching member which consists of an inverted cup-shaped body 25 threaded at its lower end to fit the threading of the bore 4 in the barrel top, and a plurality of radial arms 26 by means of which the attaching member can be rotated. The vertical actuating shaft 14 has its lower end formed into a socket 27 adapted to slide over the square-sectioned upper end portion 9A of the agitator shaft, and the bore of this socket 27 is of a corresponding, but slightly larger, square section so that the said two shafts are interengaged against relative rotation when the actuating shaft is sufficiently lowered to slip the said socket over the upper end portion of the agitator shaft.

When our detachable unit is being separately handled as a unit, the attaching member is supported by the shoulder 24 on the collar 21, and the legs are screwed upwardly through the base 15 so as to be effectively shorter than the distance between the base and the lower threaded end of the attaching member. The unit is then lowered so as to slip the socket 27 over the upper end of the agitator shaft, and the attaching member is rotated to screw it for some distance into the threaded nipple 4 of the cover. Then the legs are screwed down until each seats on the cover and until the group of legs raises the support so that the flange 23 on the collar engages the annular shoulder 24 of the attaching member, after which each leg is locked in position by the corresponding locknut 20. When thus attached, our entire detachable unit is supported by the legs and these legs act as thrust members which clamp the attaching member to the flange 23 and exert a lifting strain on both of the latter, thereby locking the attaching member against rotation with respect to the cover of the container. By providing a plurality of legs spaced around the sleeve 21, we also distribute the weight of our detachable unit over a considerable area of the cover, and since each leg is independently adjustable, the unit can readily be adjusted so that the actuating shaft 14 alines with the shaft of the agitator.

With compressed air supplied to the motor 12 through a hose 28, the admitting of such air through the usual valve 29 starts the motor and the latter is readily regulated in speed by merely rotating the valve handle 30. As soon as the liquid in the container has been suitably agitated, the air valve 29 is shut off, and the attaching member 25 is unscrewed from the nipple 4, after which the entire unit can be lifted off the container and used on another container.

When our unit includes a motor laterally spaced from the actuating shaft, as here illustrated, we desirably locate two legs near this motor. However, we do not wish to be limited to this leg arrangement, nor to other details of construction and arrangement above described, since changes might obviously be made without departing either from the spirit of our invention or from the appended claims.

For example, Fig. 4 shows the lower portion of a unit embodying our invention and designed for use with a container having a male threaded nipple 31 welded to its top 2. In this case, the depending sleeve 32 has a downwardly directed tube 33 below the annular shoulder 24 which supports the attaching member 34 when our unit is detached from the container, and the lower end of the tubular extension 33 can seat on the upper end of the nipple 31.

Moreover, we do not wish to be limited as to the particular motive power and motor employed for rotating the actuating shaft 14, nor as to any particular type of reducing gear if the motor speed is so high as to require any.

We claim as our invention:

1. A detachable unit for use with a container having an aperture in its top and having within the container an agitator shaft presenting an end in alinement with the shaft: actuating means including a support, driving means mounted on the support and below the support, the actuating shaft having its lower end formed for interlocking with the said agitator shaft end, attaching means carried by the support and arranged for threaded engagement with the container top, and legs spaced from the attaching means and resting on the container top to support the weight of the said unit.

2. A detachable unit as per claim 1, in which the legs are independently adjustable

in height to permit a ready alining of the said two shafts.

3. For use with a container having a threaded inlet in its top and having within the container an agitator shaft presenting an end in alinement with the said inlet: actuating means including a support, a motor and a reducing gear connected to the motor, the said motor and reducing gear being both mounted on the support, the reducing gear including a shaft extending downwardly beyond the support and formed at its lower end for interlocking with the said agitator shaft end, and attaching means for attaching the support to the container top at the said inlet, the attaching means being rotatable on the support and having a threaded portion fitting the threaded inlet.

4. Agitator-shaft actuating means as per claim 3, in combination with auxiliary means carried by the support and engaging a portion of the container top spaced from the said inlet to co-operate with the attaching means in securing the said actuating means firmly to the container top.

5. Agitator-rotating means for use with an agitator rotatably mounted in a container and having an agitator shaft-end of non-circular cross-section alining with a threaded opening in the top of the container; comprising a bodily portable unit including a motor, a depending actuating shaft and a driving connection interposed between the motor and the actuating shaft, the latter shaft having a socket at its lower end, a socket fitting the said agitator shaft-end; attaching means carried by the said unit and threadable into the container top opening, and vertically adjustable thrust means interposed between the container top and the said unit.

6. Agitator-rotating means as per claim 5, in which the attaching means are rotatable about the axis of the said vertical shaft, and are supported by the said unit with freedom for limited vertical movement.

7. For use with a container having an opening in its top and having an agitator within the container operable by an agitator shaft presenting an end in alinement with the said opening: actuating means comprising a support, a motor-driven shaft depending from the support and formed for interlocking with the said agitator shaft end, for interlocking the latter with the container at the said opening against upward movement of the support, and adjustable means interposed between the support and the container top for raising the support, the attaching means and the support having portions engaged when the support is raised.

8. For use with a container having an opening in its top and having an agitator within the container operable by an agitator shaft presenting an end in alinement with the said opening: actuating means comprising a support, a motor-driven actuating shaft depending from the support and formed for interlocking with the said agitator shaft end, attaching means carried by the support for interlocking the latter with the container at the said opening against upward movement of the support, and legs threadedly connected to the support and seating on the container top; the attaching means being rotatable on the support about the axis of the actuating shaft, the support and the attaching means having shoulders interengageable upon a raising of the support by a rotation of the legs about their own axes.

9. For use with a container having a threaded inlet in its top and having within the container an agitator shaft presenting an end in alinement with the said inlet: actuating means including a support having a depending sleeve provided at its lower end with a radial flange; an attaching member rotatably mounted on the sleeve and adapted to be supported by the said flange, the said member being threaded at its lower end to fit the inlet; an actuating shaft journaled on the support and extending downwardly through the said sleeve and having its lower end formed for interlocking with the said agitator shaft end; driving means carried by the support and operatively connected to the actuating shaft; and means interposed between the support and container top for raising the support.

10. Agitator-shaft actuating means as per claim 9, in which the said interposed means comprise upright legs spaced circumferentially about the axis of the actuating shaft and threadedly connected to the support.

11. For use with a container having a threaded nipple in its top and having within the container an agitator shaft presenting an end in alinement with the said nipple: actuating means including a support having a depending sleeve provided at its lower end with a radial flange; an attaching member rotatably mounted on the sleeve and adapted to be supported by the said flange, the said member being threaded at its lower end to fit the nipple; a motor-driven actuating shaft rotatably mounted on the support and extending downwardly through the said sleeve and having its lower end formed for interlocking with the said agitator shaft end; driving means carried by the support and operatively connected to the actuating shaft; and adjustable means carried by the container top and engaging the container top for raising or lowering the support with respect to the container top.

12. For use with a container having an aperture in its top and having within the container an agitator including an agitator shaft presenting an end in alinement with the said aperture: actuating means comprising a support; a motor, a reducing gear and a depending actuating shaft all carried by the support,

the motor being disposed at one side of the actuating shaft and the latter having its lower end formed for interlocking with the said agitator shaft end; means adjacent to the actuating shaft and carried by the support for attaching the latter to the container top, and a pair of legs mounted on the support adjacent to the motor and engaging the container top.

13. Agitator-shaft actuating means as per claim 9, in which the attaching means are slidable upon the sleeve longitudinally of the latter, and in which the said flange is so spaced from the part of the support above the sleeve as to permit the attaching means to be slid toward or away from the flange.

Signed at Chicago, Illinois, December 15th, 1927.

SVEND BRAMSEN.
WILLIAM HERSLEB.