T. G. LINDERME.

YIELDABLE JOINT.

APPLICATION FILED AUG. 8, 1919.

1,386,265.

Patented Aug. 2, 1921.

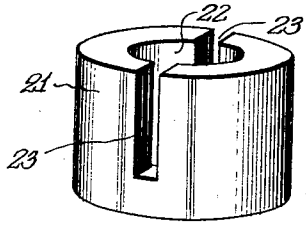



Fig. 4.

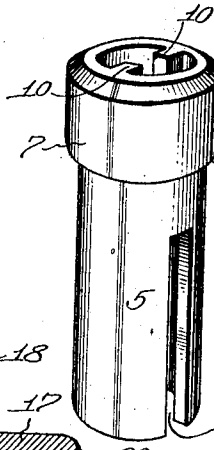



Fig. 5.

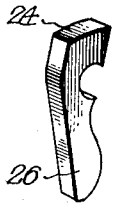



Fig. 6.




Fig. 1.

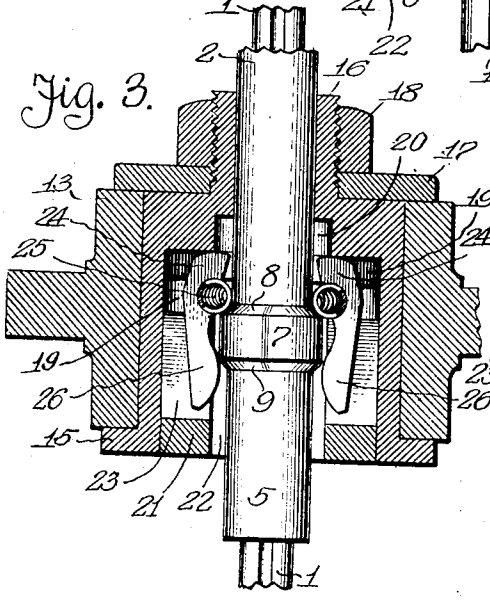



Fig. 3.

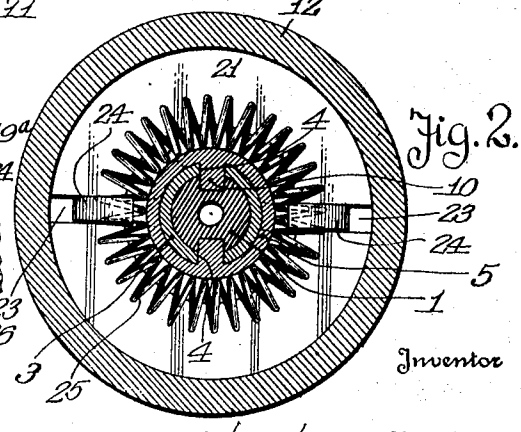



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## YIELDABLE JOINT.

1,386,265. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed August 8, 1919. Serial No. 316,079.

*To all whom it may concern:*

Be it known that I, THEODORE G. LINDERME, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Yieldable Joints, of which the following is a specification, reference being had therein to the accompanying drawings.

In my Patent No. 1,199,998, granted Oct. 3, 1916, there is disclosed a bottle washing machine which includes,—*inter alia*—an interior cleaning brush and an operating mechanism therefor, the operating mechanism imparting a reciprocatory movement to the brush during a rotary movement thereof, and provision is made so that the brush may yield or slip in its reciprocatory movement when a cork, closure or other obstacle is encountered at the neck of the bottle.

The object of the present invention is to provide a more simple, durable and yieldable joint than that disclosed in my former patent above referred to. The present joint is not only applicable to bottle washing machines, but capable of general use, especially when a reciprocatory member slides on a rotary or stationary member and it is desired to have the actuating means of the reciprocatory member automatically release the reciprocatory member.

The above and other objects are attained by a mechanical construction that will be hereinafter considered and then claimed, and reference will now be had to the drawing, wherein—

Figure 1 is a vertical sectional view of the yieldable joint;

Fig. 2 is a horizontal sectional view of a portion of the same;

Fig. 3 is a vertical sectional view of the yieldable joint on a smaller scale, showing the joint as having yielded or slipped;

Fig. 4 is a perspective view of the detached retainer;

Fig. 5 is a perspective view of a detached slitted slip member, and

Fig. 6 is a perspective view of a detached yieldable member.

Since my yieldable joint has been especially designed for bottle washing or cleaning machines, for instance of the type disclosed in my prior Patent No. 1,199,998, I have shown in this application certain parts of the machine so that the yieldable joint may be identified therewith, but the illustrated parts have been slightly changed as will be noted hereinafter.

In the drawing, the reference numeral 1 denotes a rotary tubular member and slidable on said member is a reciprocatory member 2 which has the lower end thereof reduced, as at 3, and the reduced portion provided with diametrically opposed longitudinal slots 4.

Fixed on the reduced end 3 of the reciprocatory member 2 is a slitted or slotted slip member 5, said member having longitudinal slits or slots 6 adapted to normally register with the slots 4 in the reciprocatory member 2. The upper end of the slip member 5 is provided with a cylindrical head 7 with the upper and lower ends thereof beveled, as at 8 and 9. In the slip member 5 are opposed longitudinal keys or splines 10 which extend through the slots 4 of the reciprocatory member 2, and engage in longitudinal keyways or grooves 11 in the rotary member 1, thereby establishing a rotary driving relation between the rotary member 1, the reciprocatory member 2 and the slip member 5, whereby all of said members may be revolved in unison while the members 2 and 5 are reciprocated on the member 1.

To reciprocate the member 2, I employ a cylindrical housing 12, and said housing is rotatable in a trunnioned collar 13 carried by the arms 14 of a presser head (not shown). The lower end of the housing 12 is formed with a peripheral flange 15 which limits its insertion in the collar 13 and thus correctly positions said housing therein. The upper end of the housing is reduced and exteriorly screwthreaded, as at 16, so as to have a sliding fit on the reciprocatory member 2 and at the same time accommodate a retaining washer 17 and a nut 18, said washer and nut constituting means on the upper end of the housing to retain it in engagement with the trunnioned collar 13, consequently said retaining means will cooperate with the flange 15 in preventing accidental displacement of the housing.

The housing 12 provides a cylindrical chamber 19 and the upper wall of said chamber has diametrically opposed slots 19ª and a recess 20 which provides clearance for the head 7 of the slip member 5. In the lower end of the chamber 19 is mounted a slotted retainer 21, said retainer having a central

bore 22 providing clearance for the slip member 5 and side slots 23 alining with the slots 19ª for yieldable members 24. The retainer 21 is of less depth than the chamber 19 so that the yieldable members 24 may occupy the upper portion of said chamber, and said members are diametrically opposed and somewhat pawl-like in action. The members 24 are supported by a circular coiled spring 25 which surrounds the slip member 5 and normally engages the lower beveled end 9 of the slip member head 7, as shown in Fig. 1, said spring being held between the upper wall of the chamber and the upper end of the retainer 21. In this position of the slip member relative to the housing 12, the upper ends of the yieldable members 24 engage the side walls of the head 7 and the lower beveled ends 26 of said yieldable members extend into the slots 23 of the retainer 21 and into the slits or slots 6 of the slip member 5, thereby establishing a driving relation between the retainer 21 and the slip member 5. Since the retainer 21 is fixed in the housing 12, said housing may revolve in its trunnioned collar.

The circular coiled spring 25 which snugly embraces the slip member 5 constitutes a yieldable support for the slip member 5 as said coiled spring rests on the upper end of the retainer 21. Besides, the yieldable members 24 are fitted on the coiled spring 25 and if necessary may be soldered or otherwise connected to certain convolutions of said spring, however, the yieldable members 24 are supported on the coiled spring with the ends thereof extending into the slots 19ª and 23 and in this manner the yieldable members 24 are held against displacement within the housing 12.

The rotary member 1 may have movement imparted thereto at any place so long as it does not interfere with the reciprocatory movement of the member 2, and it is possible to impart movement to the rotary member 1 through the medium of the housing 12 which may revolve in its trunnioned collar 13.

Assuming that in raising the reciprocatory member 2 that some obstruction or obstacle is encountered thereby, a retardation in the movement of the reciprocatory member 2 causes the upwardly moving yieldable support 25 and yieldable members 24 to recede, the spring constituting a yieldable support 25 expanding to such an extent as to permit of the head 7 of the slip member 5 passing through said spring. This movement of the head 7 is facilitated by the upper beveled end of said head and in consequence of said head expanding the spring or yieldable support 25, the yieldable members 24 are carried outwardly, thereby removing the lower beveled ends 26 of said yieldable members from the slits or slots 6 of the slip member 5, as best shown in Fig. 3. The slip member 5 may continue to revolve the reciprocatory member 2 and the rotary member 1, but the housing 12 will remain stationary.

When the reciprocatory member 2 recedes or is lowered, as in connection with my bottle washing machine, the yieldable support 25 again rides over the head 7 of the slip member 5 and engages under said head, thus again establishing an active relation between the parts of the yieldable joint.

From the foregoing it will be observed that I not only disconnect a reciprocable member relative to its actuating means, but also disconnect said member relative to its rotary support, so that if said reciprocable member should be revolved, through the medium of its support, then the support is released from its rotary movement as well as its reciprocatory movement.

I would have it understood that the structural elements of my invention are susceptible to such modifications and alterations as fall within the scope of the appended claims.

What I claim is:—

1. In a yieldable joint, a reciprocatory and rotary member, a slip member adapted to raise said reciprocatory member and rotate therewith, a housing inclosing said slip member, yieldable means in said housing normally engaging said slip member so that said housing may elevate said reciprocatory member, and a yieldable support surrounding said slip member and supporting said yieldable means.

2. In a yieldable joint, a reciprocatory and rotary member, actuating means therefor, and releasing means rotatable with said reciprocatory member and interposed between said reciprocatory member and its actuating means, comprising a yieldable support and opposed members carried thereby.

3. A yieldable joint comprising a reciprocatory and rotary member, actuating means therefor, a slip member in said actuating means and rotatable with said reciprocatory member, a circular coiled spring supporting said slip member, and means including opposed members supporting said spring relative to said actuating means.

4. A yieldable joint comprising a reciprocable and rotary housing, a member adapted to be rotated and reciprocated from said housing, a slip member in said housing on said member, opposed members in said housing establishing a rotary driving relation between said housing and the first mentioned member, and yieldable means supporting said opposed members.

5. In a yieldable joint, a rotary member, a reciprocatory member, a slip member articulating all of said members for rotating in unison, reciprocating means for said reciprocatory and slip members, and a coiled spring

supporting said slip member relative to the reciprocating means thereof.

6. In a yieldable joint, a rotary member, a slip member keyed to said rotary member to rotate with said member and adapted to raise said member during its rotation, and rotating means for said slip member normally engaging said slip member to establish a driving relation, said rotating means being movable to and from said slip member and adapted to be actuated by said slip member to disengage said rotating means so that said slip member will be free of said rotating means.

In testimony whereof I affix my signature in the presence of two witnesses.

THEODORE G. LINDERME.

Witnesses:

KARL H. BUTLER,

ANNA M. DORR.