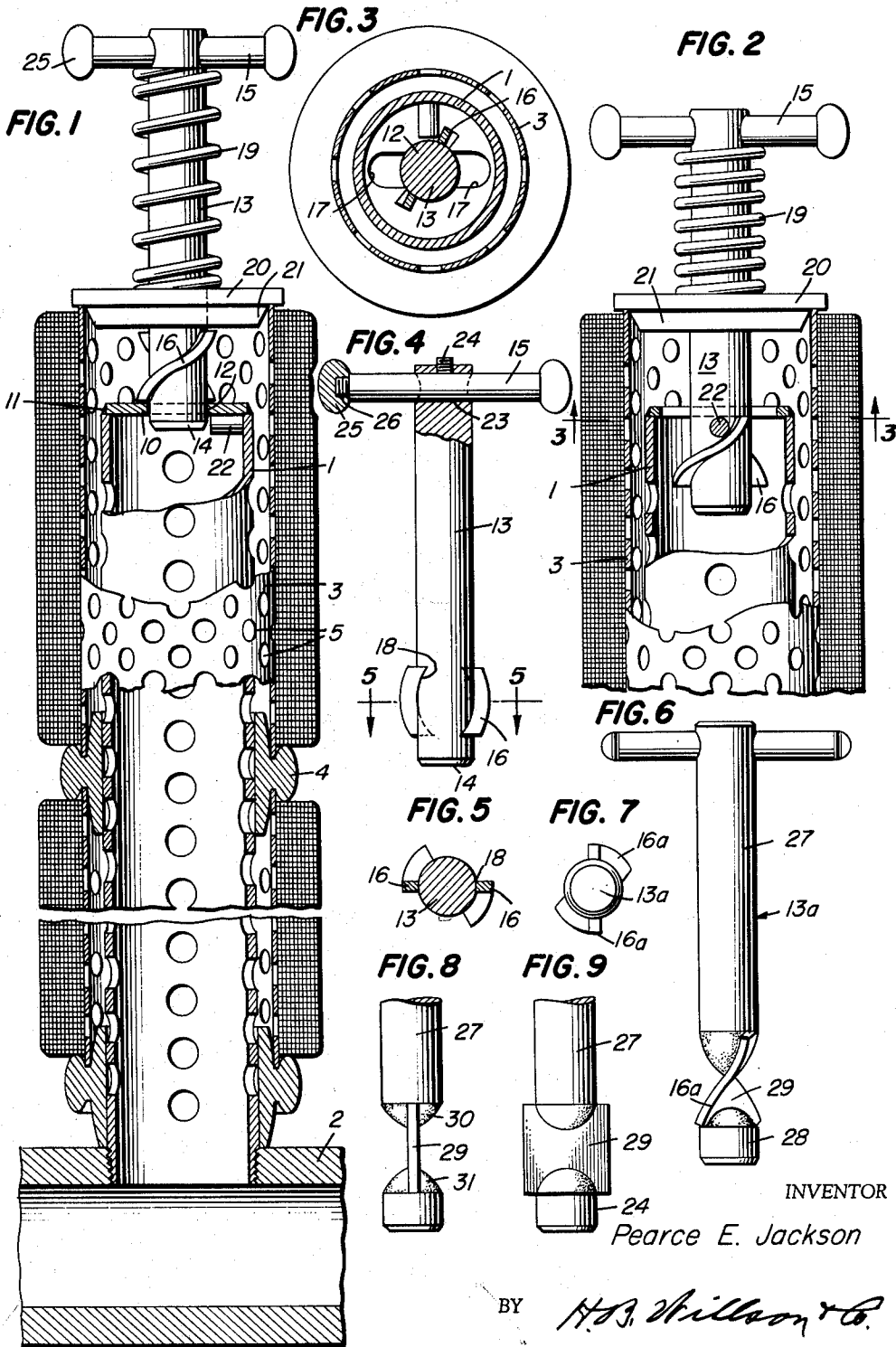


April 23, 1963

P. E. JACKSON
MEANS FOR FASTENING AND SEALING YARN PACKAGES ON PERFORATED
CIRCULATING PIPES OF DYEING MACHINES

3,086,381

Filed Dec. 14, 1962



1

3,086,381

MEANS FOR FASTENING AND SEALING YARN PACKAGES ON PERFORATED CIRCULATING PIPES OF DYEING MACHINES

Pearce E. Jackson, 2207 Slate Drive, Columbus, Ga.

Filed Dec. 14, 1962, Ser. No. 244,735

7 Claims. (Cl. 68—198)

This invention relates to dyeing and treating apparatus of the type handling packages of yarn, cotton or other strands of material wound on cores usually in the form of perforated tubes or springs.

In such apparatus one or more of the thread packages are spitted or telescoped over perforated upright circulating pipes disposed in a tank in such manner that the dye liquor or other treating liquid may be circulated under pressure through the pipes, the cores and the wound material, either outwardly or inwardly with respect to the pipes. Usually a large number of such circulating pipes are disposed in closely spaced relation on a manifold which forms the bottom of a carrier that is removable from the tank. These carriers may have a diameter up to 70" and each of the many circulating pipes may carry as many as 10 wound packages.

The invention is an improved means for retaining the packages on a circulating pipe, closing the top of the tubular core of the uppermost wound package, and sealing the series of packages on the circulating pipe to prevent by-passing of the liquor.

While various means have been proposed for accomplishing that result, the most commonly practiced method is to weld an upright screw threaded stud at the center of a closure plate or member at the top of the circulating pipe, place a washer like cap on the stud to close the top of the core of the uppermost package and to then screw a nut down on the stud against the cap to apply downward pressure on the series of cores and sealing rings between the latter, or against the several wound packages if coil spring cores are used. Even when those parts are made of stainless steel, the chemicals used in dyeing or bleaching liquid, will cause galling of the metal, this being especially true with respect to the screw threaded portions when the latter are hot. In addition to that objection of the nut seizing or galling to the screw stud, there is this further objection, that it requires considerable time to screw the many nuts down and to remove them from the studs. Also, after the nuts have been tightened, by-passing of the liquid sometimes occurs because of the differences in the coefficients of expansion of the different metals from which the said parts and the cores and sealers are made.

The principal object of the invention is to provide a quick and easy means for both retaining and sealing the wound packages on the spindle-like circulating pipe by the use of yieldable means including a rotatable locking pin which, when given a partial turn, will lock or unlock the assembled elements.

The invention contemplates an anchor member fixed to the top of the circulating pipe and provided with an opening to receive the lower end of a manually turnable locking pin, the latter having a laterally projecting locking lug means and also carrying a coiled compression spring and a slidable cap to close and seal the top of the core of a wound package, the spring serving to both press the cap on the core and frictionally hold the lug means in engagement with the anchor member after the pin has been entered into the anchor member and given a partial rotation.

Another object of the invention is to provide a device of the above indicated character in which the locking lug means is helical in shape to facilitate the manual movement of the pin to its locking position.

2

Another object is to provide a sealing and fastening device of this character which is of simple, strong and durable construction, which is reliable and effective in use, and which will save a great deal of time.

With the above and other objects and advantages in view, the invention resides in the novel combinations and arrangements of parts and the novel features of construction hereinafter described and claimed, and illustrated in the accompanying drawings which show the present preferred embodiments of the invention.

FIG. 1 is a vertical elevational view with parts broken away and in section, showing one circulating pipe rising from a manifold and having at its top my improved sealing and fastening device associated with the core of the uppermost wound package, the device being shown in its unlocked position;

FIG. 2 is a similar view showing the upper part of FIG. 1 in a locked position;

FIG. 3 is a cross sectional view taken on line 3—3 in FIG. 2 looking in the direction of the arrow;

FIG. 4 is a side view of the locking pin with parts in section;

FIG. 5 is a detail section taken on line 5—5 in FIG. 4;

FIG. 6 is a side view of a modified form of locking pin which may be used in place of the locking pin shown in FIG. 2;

FIG. 7 is a view of the lower end of the locking pin shown in FIG. 6;

FIG. 8 is a side view of the form of locking pin shown in FIGS. 6 and 7 but in a partially finished state; and

FIG. 9 is a view similar to FIG. 8 but showing the unfinished pin turned 90°.

Referring more in detail to FIGS. 1—5, the numeral 1 denotes an upright perforated circulating pipe which rises from and is in communication with a liquid manifold 2 which may form a fixed part of a dye tank or may be the bottom part of a carrier that is removable from the tank, such as shown in the S. W. Jackson Patent 2,196,559 April 9, 1940. The yarn or thread to be dyed or treated is wound on tubular cores which may be springs or perforated metal tubes such as shown at 3 in FIGS. 1 and 2. When the cylindrical perforated cores 3 are used, sealing rings 4 are used between them to prevent by-passing of the liquid between the packages. The tube 3 has the usual apertures or holes 5.

The invention contemplates a suitably apertured anchor member or plate 10 that is fixed to and closes the upper end of the circulating pipe 1. It may be a circular metal plate placed on the pipe and fastened by welding its edge to the end of the pipe as shown at 11. At the center of the anchor member 10 is a circular opening 12 of a size to receive the lower end of a straight cylindrical locking pin 13. The lower end of the pin is tapered or beveled as at 14 to facilitate the insertion of the pin in the opening, and at the top of the pin is a removable handle 15 preferably in the form of a cross bar.

Fixed to the pin in spaced relation to its end 14, is at least one laterally projecting locking lug member 16 of a size to pass through a laterally disposed enlargement 17 of the opening 12 in the anchor plate. Preferably the opening in the plate 10 is in the form of a keyhole slot having the circular portion 12 and two diametrically opposed extensions 17. Hence there are two opposed lugs 16 and preferably they are elongated or of rib-like shape and each is a partial helix so that the locking pin will be screwed into the plate. These curved or helical ribs or lugs have their outer edges rounded and their flat inner edges may be welded to the pin 13, as shown at 18.

Carried by the pin 13 between the handle 15 and the lugs 16 is a coiled compression spring 19 and a slidable

closure plate or cap 20 for the upper end of the uppermost core 3. The closure 20 may be a flat circular plate of greater diameter than the core but I preferably provide on its bottom face a frusto-conical enlargement 21, the beveled edge of which fits into the top of the core 3 to provide a better seal and to center the package on the pipe. The length of the spring 19 and the pin 13 are such that when the parts of the device are in the unlocked position shown in FIG. 1, the spring is not compressed, the end 14 of the pin is in the opening 12, the self-centering and sealing cap 20 is resting on the top of the package core 3, and the lower ends of the helical lugs or ribs 16 engage the upper face of the cap. In order to lock the parts, no downward pressure is necessary. Handle 15 is turned and thus the pin is rotated clockwise until the lower ends of the locking lugs register with the two arms 17 of the keyhole slot and enter the same. Handle 15 is then turned one quarter around requiring no downward pressure on the handle as the shape and the position of lugs 16 causes the lugs to screw entirely through the anchor plate 10 until the upper ends of the lugs leave the slot and engage the underface of plate 10. In such position shown in FIG. 2, the spring will be compressed about a third of its length and will both firmly press the cap on the core and hold the upper ends of the lugs in frictional engagement with the under face of the plate 10. Each of the helical lugs preferably extends around slightly less than 90° of the circumference of the pin 13 and hence the pin is given about a quarter turn after the upper ends of the lugs leave the keyhole slot. If desired an inwardly projecting stop lug 22 may be fixed to the inner surface of the pipe 1 below the plate 10 for engagement by the lugs after the pin 13 has been given a quarter turn. That will prevent the pin from being rotated 180° or to a position where the upper ends of the lugs register with the arms of the keyhole slot.

The handle 15 may be a straight cylindrical rod disposed in a transverse opening 23 near the top of the pin and removably held by friction or by a set screw 24 or other means. As shown in FIG. 4, the handle bar 15 may have at its ends enlarged rounded knobs 25, at least one of which is screwed on a reduced and threaded end 26 of the bar. The handle is of course removable to permit the spring and sealing cap to be applied after the locking lugs have been welded on the pin.

In FIGS. 6-9 I have shown an alternate form of locking pin that may be used in the device in place of the pin 13. In this form the pin 13^a is made of a long upper section 27 and a short lower section 28 connected by a flat metal plate 29 which is given a 90° twist to provide the two helical locking lugs or ribs 16^a that serve the same function as the parts 16. The sections 27 and 28 are cylindrical and the plate 29 is rectangular and wider than the diameter of the two sections as shown in FIG. 9. The ends of the flat plate are disposed diametrically of the ends of the two sections and fastened to the same by welds 30 and 31 as shown in FIG. 8. After the welding operation, the plate is given a 90° twist to provide the finished pin 13^a shown in FIGS. 6 and 7.

In using the device the one or more cores 3 with the material wound thereon are telescoped over the pipe 1, and the end 14 of the pin is inserted in the opening 12 so that the parts are in the position shown in FIG. 1. Pin 13 is turned by the use of handle 15 until the lower ends of lugs 16 enter the extension 17. This requires no downward pressure. The handle 15 is then rotated clockwise so that the helical lugs screw through the keyhole slot, thus compressing the spring 19. The pin is then given a quarter turn by the use of handle 15. This requires no downward pressure because of the helical shape of the lugs, the parts then being in the lock position shown in FIG. 2 in which the spring applies downward pressure on the cap and frictionally holds the upper end of the lugs 16 in engagement with the bottom of the plate 10. To unlock the parts the pin is turned in a

counter-clockwise direction until the upper ends of the lugs register with the arms of the keyhole slot, whereupon the spring will cause the pin to be screwed upwardly to the position shown in FIG. 1. Making the locking lugs 16 in the form of helices greatly assists the operator in moving the pins to their locked position since in loading a carrier must manipulate the pins 13 at arms length and shoulder height because the circulating pipes are closely spaced on carriers having a diameter up to 70" and frequently as many as 10 cores are on each circulating pipe. One of the many advantages of this invention is that it requires no downward pressure on the handle to completely lock and seal the top tube or spring.

From the foregoing, taken in connection with the accompanying drawing, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been disclosed, attention is invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. In a device of the character set forth, the combination of,

- (a) an upright perforated liquid circulating pipe,
- (b) an anchor plate fixed across the top of said pipe and having a central opening with at least one lateral extension,
- (c) a wound package core surrounding and projecting above the upper end of said pipe,
- (d) a manually turnable locking pin having its lower end insertable in said opening,
- (e) laterally projecting locking lug means on the lower portion of said pin and insertable in said extension,
- (f) a coil spring on the upper portion of said pin and compressible in an upward direction, and
- (g) a closure cap for the upper end of said core slidably and rotatably carried by said pin between said spring and said locking lug means whereby when said pin is turned requiring no downward push by operator, the said pin moves downwardly to dispose said lug below said anchor plate and is partially rotated and then released, said spring will press said cap on said core and frictionally lock said lug against the underface of said anchor plate.

2. The combination of claim 1 in which said locking lug means is of helical shape to screw through said anchor plate.

3. The combination of claim 1 in which said hole and its extension form a keyhole slot in said anchor plate, and said locking lug means comprises two helically shaped ribs on opposite sides of said pin adapted to pass through the arms of said keyhole slot.

4. The combination of claim 3 in which said core is a perforated cylindrical tube and said closure cap has a frusto-conical shaped lower portion to enter the top of said core tube to seal the same and center it on said pipe.

5. The combination of claim 4 together with a removable cross-bar handle at the top of said pin and against which the upper end of said spring thrusts.

6. The combination of claim 3 in which said helical ribs are welded on said pin.

7. The combination of claim 3 in which said helical ribs are formed by the outer edges of a flat rectangular metal plate welded between the ends of upper and lower sections of said pin, said plate having a 90° twist relative to the longitudinal axis of the pin.

References Cited in the file of this patent

UNITED STATES PATENTS

1,903,585	Annin	Apr. 11, 1933
2,068,277	McConnell	Jan. 19, 1937
2,512,951	Luther	June 27, 1950