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E. S. CULVER

2,204,928

LOCKING DEVICE

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FIG. 1

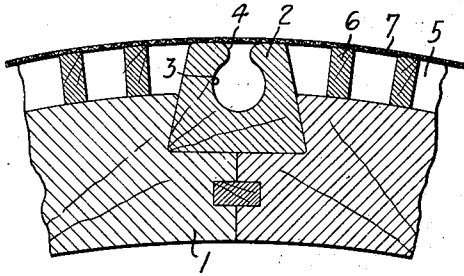


FIG. 2

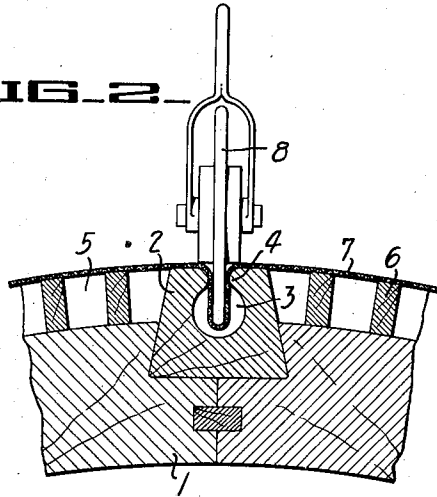


FIG. 3

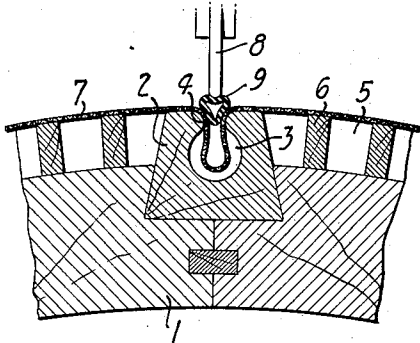


FIG. 4

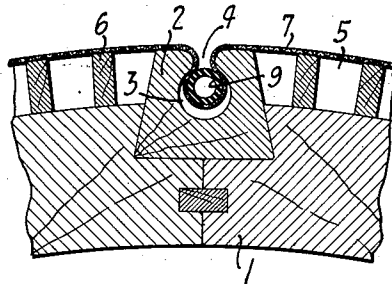
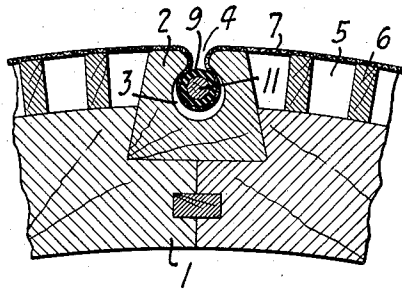


FIG. 5



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2,204,928

LOCKING DEVICE

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5 Claims. (Cl. 210—199)

This invention relates in general to a locking device for securing a piece of fabric to a base member, and more particularly to a locking mechanism for securing a section of filter fabric to the division strips of a rotary drum filter.

A rotary drum filter consists essentially of a pulp or slurry tank within which is rotatably disposed a drum formed on its outer surface with a plurality of adjacent independent filter cells defined by a plurality of spaced, longitudinally extending parallel division strips. The outer surfaces of the filter cells so formed are covered with a fabricated filter medium which is secured to the drum by longitudinally extending grooves formed in the division strips. In the past, various expedients have been resorted to for holding the fabric within the grooves of the division strips, such as by caulking, by screwing a solid strip of material within the groove of the division strip and over the filter fabric, or by the use of complementary wedge-shaped members as shown in the United States Duvall Patent No. 2,055,251 of September 22, 1936. Each of these expedients so resorted to is objectionable for some reason or other, as for example that the caulking works loose or that the filter fabric is not held with sufficient tension over the filter cells.

In general, the object of this invention is the provision of locking means for holding a piece of fabric within a grooved base member in such a way that the fabric may be tightly and smoothly held in place and yet readily removed if so desired.

More specifically, the object of my invention is the provision of a grooved base member formed with a restricted throat, in combination with a flexible rubber tubing which may be disposed within said groove and maintained in distended position so as to lock a section of filter fabric within the groove.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawing accompanying and forming a part of the present specification is outlined in full. In said drawing, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in a plurality of forms.

Referring to the drawing:

Figure 1 is a fragmentary section of a rotary drum filter showing a grooved division strip formed with a restricted throat.

Figure 2 shows the method of inserting a fold of the filter medium within the grooved division strip shown in Figure 1.

Figure 3 shows a method of inserting a piece of rubber tubing within a fold of the section of filter medium disposed within the grooved division strip shown in Figure 1.

Figure 4 is a fragmentary section of a rotary drum filter showing a section of filter fabric disposed within a grooved division strip and held in place by a section of rubber tubing.

Figure 5 is a fragmentary section of a rotary drum filter showing the section of rubber tubing held in distended position by the insertion of a section of doweling.

The construction and operation of a continuous rotary drum filter need not here be described in detail, for it is well known to the trade and is fully disclosed in the prior art such as the United States Akins Reissue Patent No. 14,214 of November 14, 1916, and the United States Oliver Patent No. 919,628 of April 27, 1909. Briefly, the essential elements of a filter of this type consists of a pulp or slurry tank within which is made to rotate a drum provided on its outer surface with a plurality of longitudinally extending spaced division strips defining independent filter cells or compartments.

As shown in the drawing, my invention has been embodied in a rotary drum filter of this general type, comprising a drum 1 provided with a plurality of spaced parallel longitudinally extending division strips 2. Each division strip is formed with a longitudinally extending groove 3 having a restricted throat 4. The division strips define independent filter cells or compartments 5 within which are disposed drainage members 6 for supporting a fabricated filter medium or cover 7 in spaced relation with respect to the drum.

As shown in Figure 2, a fold of the filter medium 7 is inserted into the longitudinally extending groove 3 by a wheel 8, and this having been done, a section of flexible rubber tubing 9 is forced into the groove 3 within the fold of the filter medium. The resulting combination is shown in Figure 4 and from this figure it is to be noted that the normal diameter of the rubber tubing 9 is greater than the throat 4 of the groove 3 but less than the greatest width of the groove.

In order to lock the filter medium between the walls of the division strip and the section of rubber tubing, a section of doweling 11 is then inserted within the rubber tubing as shown in Figure 5.

Although only one division strip is shown in the various figures, it is obvious that the filter medium is secured to each of the numerous division strips of the drum in the same manner.

This method of locking the filter medium in place has various advantages over methods previously resorted to. In the first place, it will be noted that the rubber tubing 8 may be inserted within the groove 3 without moving the rubber tubing longitudinally with respect to the division strip, and therefore there is no tendency for the filter medium to move longitudinally relative to the drum, and no tendency for it to wrinkle. Since the diameter of the rubber tubing 8 is substantially less than that of the groove 3, the doweling 11 may be inserted or stemmed through the rubber tubing without causing any relative motion between the rubber tubing and the division strip. The elimination of any relative motion between the rubber tubing and the division strip during the insertion of the doweling eliminates any corresponding relative movement between the filter medium and the division strip. Lastly, the filter medium may be readily disengaged from the drum by first removing the doweling 11 from the rubber tubing and then removing the rubber tubing from the groove 3.

Although doweling has been used for holding the flexible rubber tubing 8 in its distended position, obviously the same result can be accomplished by inflating the rubber tubing with air or by the insertion of material other than doweling.

While I have described my invention with particular reference to a continuous rotary drum filter of the tank type, it may of course be used for securing any material of sheet form to any grooved base member.

I claim:

1. A clamp for locking fabric in place comprising: a base member; a groove in said member having a restricted throat; a section of hollow flexible tubing disposed in said groove, the normal diameter of said tubing being greater than the throat of said groove; a section of fabric disposed in said groove between said base member and said tubing; and means in addition to the

flexibility of said tubing for distending said tubing so as to lock said fabric within said groove.

2. A clamp for locking fabric in place comprising: a base member; a groove in said member having a restricted throat; a section of hollow flexible tubing disposed in said groove, the normal diameter of said tubing being greater than the throat of said groove; a section of fabric disposed in said groove between said base member and said tubing; and a solid member slidably disposed within said tubing for distending said tubing so as to lock said fabric within said groove.

3. A clamp for locking fabric in place comprising: a base member formed with a groove having a restricted throat; a section of hollow flexible tubing disposed within said groove, the normal diameter of said tubing being greater than the restricted throat of said groove but somewhat less than the longest cross-sectional dimension of said groove; and means within said tubing for holding it in a distended position.

4. A filter comprising: a base member formed with a groove having a restricted throat; a section of hollow flexible tubing disposed within said groove, the normal diameter of said tubing being greater than the restricted throat of said groove; a section of fabric disposed in said groove between said base member and said tubing; and means within said tubing for holding it in distended position so as to lock said fabric within said groove.

5. A filter comprising: a rotary drum; a plurality of spaced division strips secured longitudinally of said drum and dividing said drum into a plurality of adjacent independent filter cells; a longitudinally extending groove formed in one of said division strips, said groove having a restricted throat; a section of flexible tubing disposed within said groove, the normal diameter of said tubing being greater than said restricted throat; a section of fabric disposed in said groove between said division strip and said tubing; and means within said tubing for holding it in distended position so as to lock said fabric within said groove.

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