March 30, 1965 L. W. WATSON 3,175,691

DEVICE FOR DETACHABLY SECURING
DRAINAGE MEMBERS ON FILTERS

Original Filed Aug. 31, 1956 2 Sheets-Sheet 1

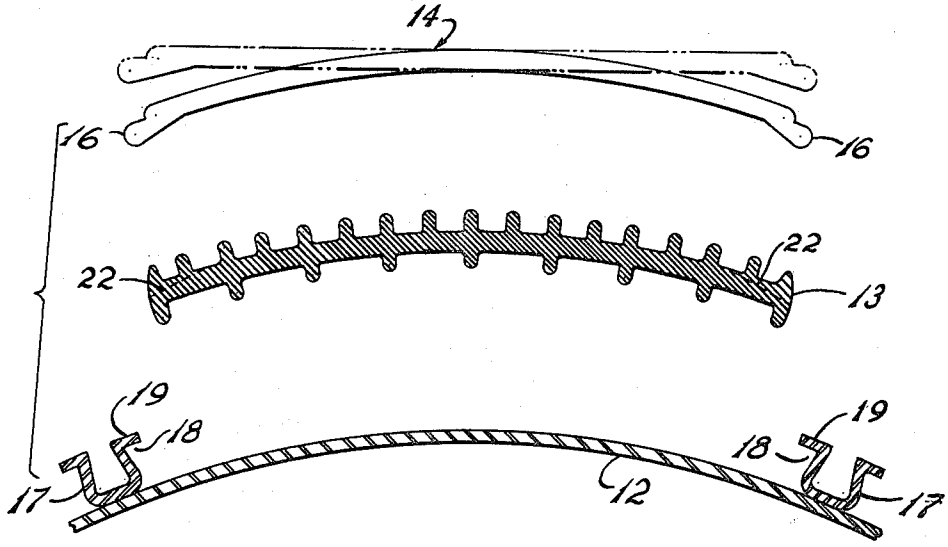


Fig. 1

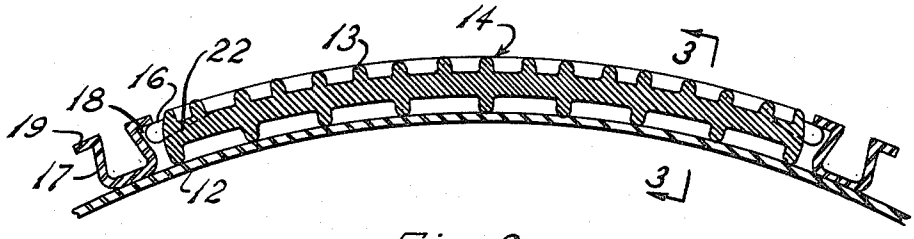


Fig. 2

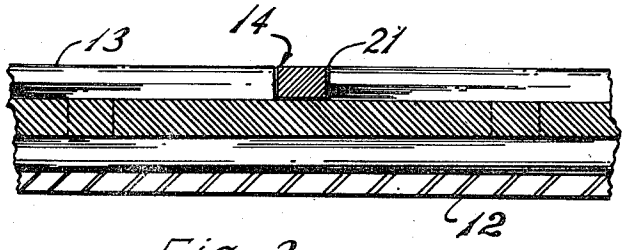


Fig. 3

INVENTOR.
Lloyd W. Watson
BY
Robert R. Finch
Attorney

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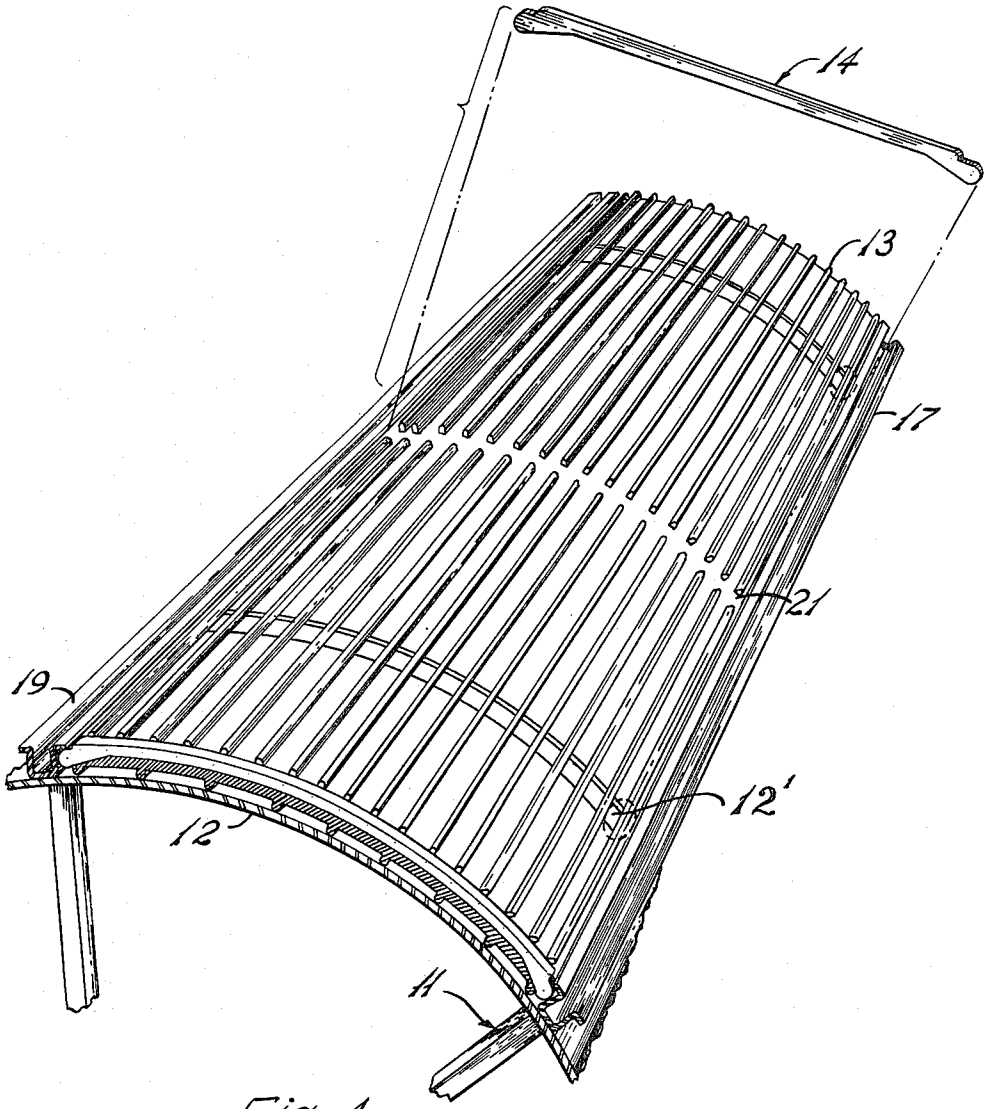


Fig. 4

INVENTOR.
Lloyd W. Watson
BY
Robert R. Finch
Attorney

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DEVICE FOR DETACHABLY SECURING DRAINAGE MEMBERS ON FILTERS

Lloyd W. Watson, Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn., a corporation of Delaware

Continuation of application Ser. No. 607,433, Aug. 31, 1956. This application Mar. 29, 1962, Ser. No. 186,294

2 Claims. (Cl. 210—404)

This application is a continuation of my application Serial No. 607,433 filed August 31, 1956, now abandoned.

This invention relates generally to rotary drum filters and particularly to improved ways and means for securing deck or drainage support sections in place on such filters.

Heretofore it has been the usual practice to secure deck sections onto filter drums by means of longitudinally extending lips on such sections which fit into undercut grooves on longitudinal divider strips on the drum itself. In such installations, such as described in United States Patent No. 2,289,411 issued July 14, 1942, the deck plate must be bent or distorted in order to snap it into place between the divider strips with the lips in engagement with the undercut portions of the strips.

This is a useful method of securing certain types of flexible decks in position, but it is limited in its application insofar as securing rigid members in place is concerned. Moreover, removal of deck sections in such prior methods also requires flexing of the deck members in order to disengage the locking devices. In inserting and removing rigid drainage members heating and special tools are required to accomplish the necessary deformation. This is a slow and costly process which may, and often does, damage the member.

It is a principal object of the present invention to provide a locking device which enables ready attachment and detachment of rotary filter deck or drainage support sections without deforming or flexing such sections thereby permitting employment of relatively rigid deck members.

Since the locking device of the present invention is separate from and not dependent upon flexing of the deck, the invention also enables the use of preformed deck sections initially constructed to conform to the filter drum surface or other base member thus obviating the necessity of flexing or bending the deck to make it conform to the drum contour.

Other objects and advantages of the invention will be apparent from a perusal of the following description of the accompanying drawings forming a part of this specification and illustrating a particular embodiment of the invention, but which is not to be taken as limiting the invention, the scope of which is defined by the appended claims rather than by the description preceding them.

In the drawings:

FIGURE 1 is a partial or fragmentary vertical section of the drum of a rotary drum filter showing a cross-sectional exploded view of the filter assembly of the invention certain elements being shown in phantom lines for clarity.

FIGURE 2 is a view similar to FIGURE 1, but showing the elements assembled.

FIGURE 3 is a sectional view taken in the plane of line 3—3 of FIGURE 2.

FIGURE 4 is a partial perspective view taken through the drum of a rotary drum filter and showing a preformed drainage support member adapted to be mounted in accordance with the present invention.

The invention is illustrated as embodied in a known rotary drum filter. In such a filter, a drum comprising stays or spokes 11 and having a peripheral side wall 12, provided with conventional drain openings (such as 12' shown in FIG. 4), serves as a base member to support the filter medium. To obtain proper support for and drainage through the filter medium a drainage support or deck member 13 is mounted on the filter drum and the filter medium (not shown) is in turn mounted on the support member.

In accordance with the present invention, the drainage member 13 is detachably mounted on drum or base member 12 by means of a separate resilient locking strip 14 which engages the drainage member 13 from above and holds it in place on the drum by means of lock members or lugs 16 on the ends of the strip which cooperate with complementary locking means on the usual longitudinal dividers 17 between which the drainage member is mounted. In the embodiment illustrated, such complementary locking means comprise undercut or otherwise formed indentations 18 adapted to engage lugs 16 when strip 14 is sprung into place as shown in FIGURE 2. Although the undercut 18 is illustrated as being formed by means of a laterally extending flange 19 on divider 17, it is to be understood that other means may be employed if desired. For instance, divider 18 may be solid and have openings cut into it if that is desired.

In order to provide substantially uniform support surface for the filter medium, a transverse groove 21 is provided adjacent the outer face of drainage member 13 into which the locking strip is adapted to fit (FIGS. 3 and 4). Also, to insure adequate strength adjacent locking lugs 16, an offset structure, best shown in FIGURE 1, is desirably employed and beveled portions 22 are provided adjacent the ends of groove 21 to accommodate such section.

Although the invention is described with particular reference to a rotary drum filter, it is to be understood that it may be employed with advantage on many other types of filter and has particular application to structures in which the filter base member is non-planar (i.e. convex or concave).

A particular advantage of the invention is that it enables the use of preformed relatively rigid drainage members such as hard rubber, plastic or steel and obviates the problems attendant upon flexing such members to lock them in place in the manner heretofore employed. Of course, if desired, the locking strip may be employed in connection with flexible drainage members, but in such case care must be taken to employ sufficient strips to form the drainage member against the base member and hold it there uniformly. In order to insure better holding of flexible drainage supports, it is also desirable to employ relatively rigid locking strips which will impart added strength to the assembly while holding a flexible drainage member in proper position.

The number of transverse locking strips required will depend upon the size, shape and physical nature of the drainage support as well as on the characteristics of the locking strip itself. However, selection of the proper number of such strips for any given assembly is within the province of any worker in the field to which this invention pertains.

As previously noted, the function of the drainage support is to provide a means for mounting the filter medium, such as a cloth or screen or the like and to provide an open area for free passage of filtrate through such medium. Hence, although a filter medium, per se, is not shown in the drawings it is to be understood that such a medium will form a part of a complete filter embodying the present invention. The drainage support also known as the drainage grid member provides conventional passage means (not shown) permitting filtrate to pass therethrough.

I claim:

1. In a filter, the combination which comprises a rotary filter drum, a plurality of divider strips fixed to the outer drum surface parallel to the drum axis and spaced from one another, each strip having a longitudinally extending lateral overhang at each side thereof; a substantially rigid drainage support member for the filter medium located on the drum surface between a pair of divider strips and shaped to conform to the curvature of the drum, said member being of substantial thickness, and formed with a plurality of transverse open-ended external grooves; a plurality of elongate springy locking members to engage respective grooves, each locking member having terminal portions providing an offset at each end sprung under a respective overhang thereby establishing pressure contact between said locking member and said groove along with reaction pressure contact between said offsets and said overhangs, and with said transverse grooves of a depth such that the upper surfaces of the locking members are substantially flush with the upper surface of the drainage member.

2. In a rotary filter having a circumferential drum surface and longitudinally extending spaced apart divider strips fixed thereto, said divider strips having laterally and longitudinally extending indentations at each side thereof and spaced above said drum; the improvement comprising, a rigid drainage support member on said drum surface loosely fitting between said divider strips to allow said drainage member to be freely mounted on said drum and removed therefrom, and means to secure said drainage member to said drum surface comprising a plurality of transverse open ended grooves formed on the outer surface of said support member, said grooves terminating in a beveled portion at each end of said groove, a plurality of resilient locking strips having offset lugged end portions inserted in said indentations and sprung into intimate contact one each with one of said grooves over the entire length of said groove including said beveled portion to hold said member securely against said drum surface.

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REUBEN FRIEDMAN, *Primary Examiner.*

ROBERT F. BURNETT, HARRY B. THORNTON, *Examiners.*