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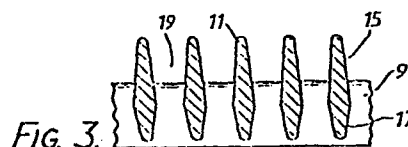
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54 Photographic processing tanks.

57 A film holder for use in a photographic developing tank, the holder including a central column (1) and a pair of annular plates (5) mounted in spaced-apart relation on the column. Each plate includes a number of radially-extending support ribs (9) which carry a spiral rib (11) forming a spiral channel to receive the film. The rib has an elongate cross-section with a first portion (15) which tapers inwardly in the axial direction facing towards the other plate, and a second portion (17) which tapers inwardly in the axial direction facing away from the other plate.



PHOTOGRAPHIC PROCESSING TANKS

Photographic processing tanks for processing lengths of exposed photographic film are well known and they consist essentially of a light-tight tank in which the film, arranged in a spiral coil, is supported on a holder. The film is loaded on to the holder under darkroom conditions, such as safelight illumination or in total darkness. The holder is then placed in the tank and the tank is made light-tight. Thereafter, the processing can be accomplished with the tank in normal lighting conditions.

The processing solutions are introduced in turn into the tank. The tanks function with the minimum of processing solutions (dictated by the exhaustion rate of the processing solutions) and yet not only allow for rapid filling and emptying of the liquids, but also ensure that the formation of air bells on the film surface is inhibited to a maximum extent.

The processing solutions must be able to move freely over the film surface so that solutions which have been exhausted in certain areas of the film emulsion may be moved to other areas of the film. Similarly, solutions which have not been involved in a great deal of activity, and are, therefore, not

exhausted, must be moved to those areas of the film where interaction with the film emulsion is greater. This periodic movement of the processing solution is conveniently brought about by completely inverting the processing tank at regular intervals.

The film holder for use in such a tank comprises a central column and a pair of annular plates mounted in spaced apart relation on the column. Each plate has a number of radially extending ribs which carry a further rib arranged in a spiral. The film is carried in the holder with the lateral edges of the film in the spaces between the turns of the respective spirally arranged further ribs.

According to the present invention, the further rib on each annular plate has such a depth relative to the radial ribs thereon to provide extra strength thereby allowing the spacing between adjacent turns of the further, rib to be increased.

Some of the advantages of the invention are

- (a) that the speed at which the tank may be filled and emptied is increased;
- (b) the formation and trapping of air bells is lessened;
- (c) the flow of processing solution during inversion of the tank is improved; and
- (d) residual solution in the tank at the end of

the final processing stage can efficiently be washed out.

Conveniently, the shaped further rib produces a "venturi effect" which assists in the flow of processing liquid. All these advantages are achieved without resorting to a tank of larger volume than that generally required for satisfactory processing of 35 mm and/or 120/220 roll film lengths and widths.

In order that the invention may be more readily understood, it will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic side elevation of a film holder;

Figure 2 is a plan view of part of a holder;

Figure 3 is a section on the line 3-3 of Figure 2; and

Figure 4 is a section on the line 4-4 of Figure 2.

A holder for a film processing tank comprises a generally cylindrical hollow tube 1 having an enlarged foot 3. A pair of annular plates 5, each with an integral stub-column 7, are mounted on the tube 1. The two stub-columns are arranged in overlapping relation so that the annular plates are in spaced apart relation. The amount of overlap of the stub-columns

can be adjusted so as to vary the spacing between the plates 5 and thereby accommodate films of different widths. Each annular plate has a plurality of radially extending ribs 9 and these ribs support a further rib 11 integral therewith which is arranged on the ribs 9 in the form of a spiral.

As shown in Figure 4, each radial rib 9 is of generally rectangular cross-section with one side providing a support surface for the film. One of the corners 13 of the support surface is chamfered. Each turn of the further rib 11 has a first part 15 which projects beyond the support surface of the ribs 9 and a second part 17 which extends almost to the side of the rib which is opposite the support surface.

Adjacent sides of adjacent turns of the further rib diverge at the first part 15 and also diverge at the second part 17 so that the space 19 between adjacent turns is in the form of a venturi.

The further rib is of more rigid construction than has been known heretofore and this permits the spacing between adjacent turns of the rib to be increased.

CLAIMS:

- 5 1. A film holder for use in a photographic developing tank,
the holder including a central column (1) and a pair of annular
plates (5) mounted in spread-apart relation on the column, each
plate including a number of radially-extending support ribs (9)
which carry a spiral rib (11) forming a spiral channel between its
10 turns for retaining the edge of the film, the said spiral rib having
an elongate cross-section which has a first portion (15) which is
tapered inwardly in the axial direction facing towards the other
plate, and a second portion (17) which is tapered inwardly in the
axial direction facing away from the other plate.
- 15 2. A film holder according to claim 1, in which the said first
portion of the spiral rib projects beyond the support surfaces of
the radial ribs and the said second portion extends across a major
part of the depth of the radial ribs toward the side which is
20 opposite the support surface.
3. A film holder according to claim 1 or claim 2, in which
each radial rib has a chamfered surface (13) facing the leading edge
of a film as it is fed into the spiral, to facilitate entry of the
25 film.

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FIG. 1.

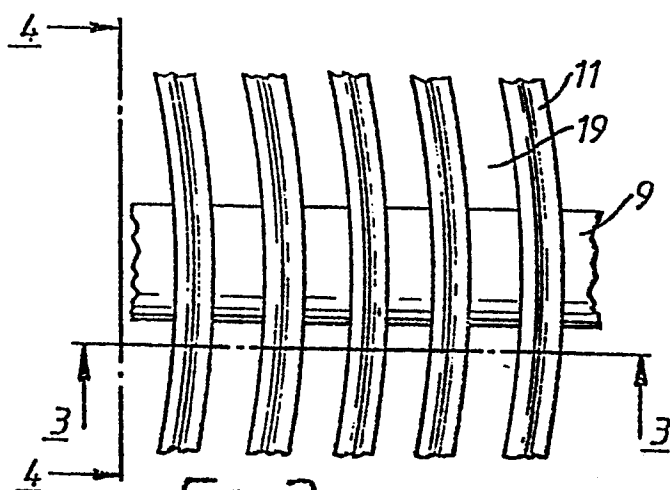
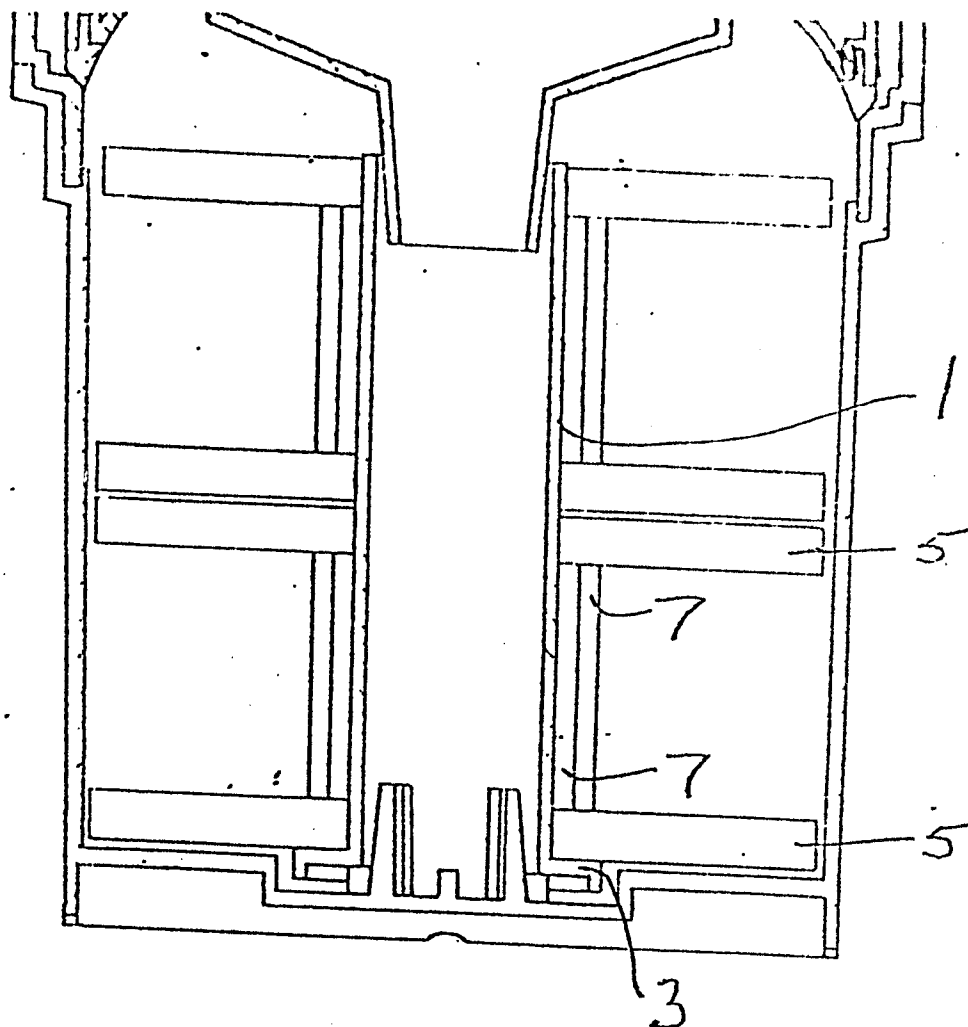


FIG. 2.

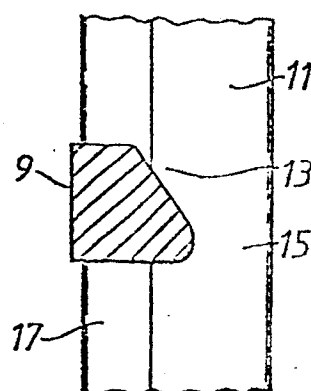


FIG. 4.

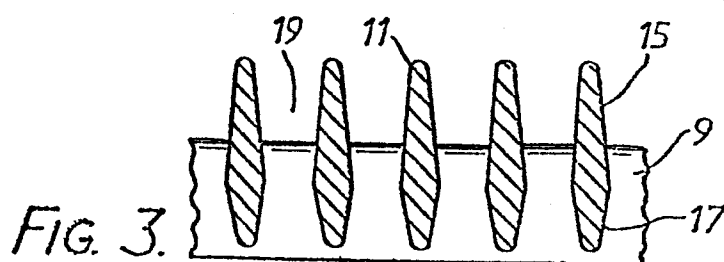


FIG. 3.



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EUROPEAN SEARCH REPORT

0181699

Application number

EP 85 30 7215

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	US-A-2 835 181 (A.R. SEELEY) * Columns 2,3; figure 1 *	1	G 03 D 13/14
A	--- US-A-2 151 907 (L.R. FINK) * Pages 1,2; figure 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			G 03 D 13/14
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10-01-1986	Examiner BOEYKENS J.W.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	