Sept. 28, 1954 H. A. KULJIAN 2,690,068

MEANS FOR DETACHABLY MOUNTING SCRAPERS BETWEEN TWO ADJACENT ROLLS

Filed Jan. 2, 1953 4 Sheets-Sheet 1

Fig. 1.

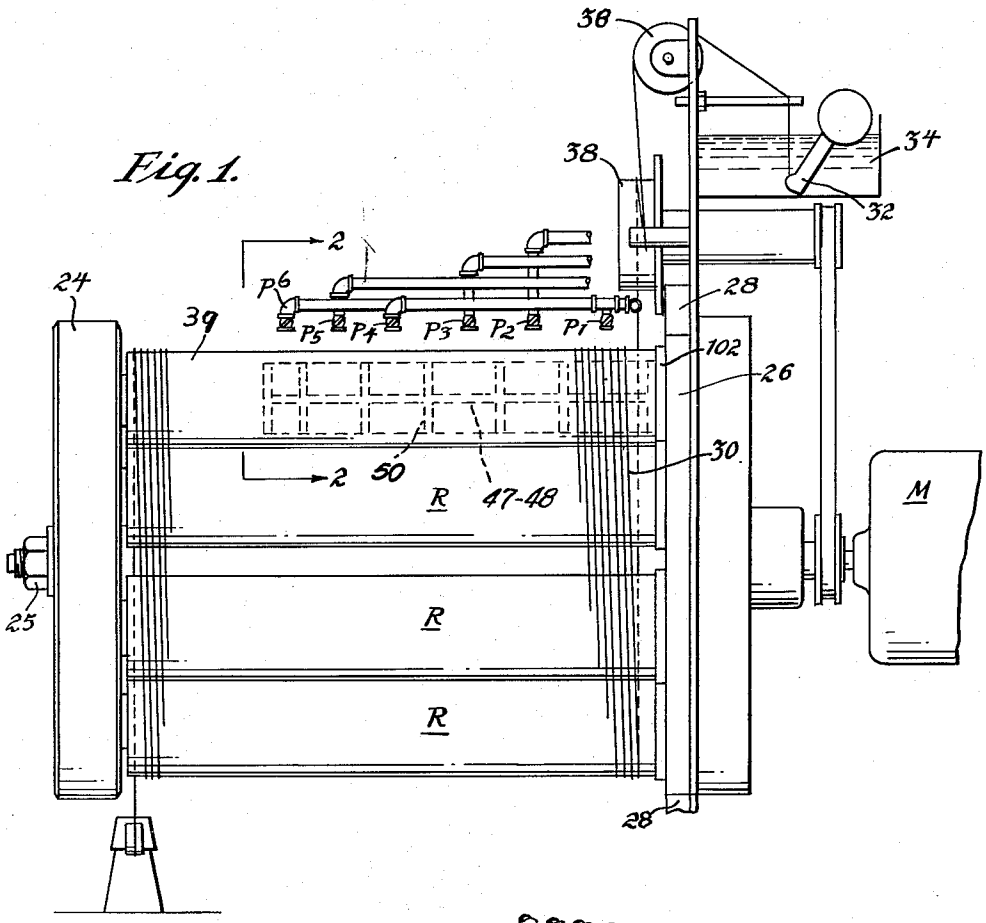
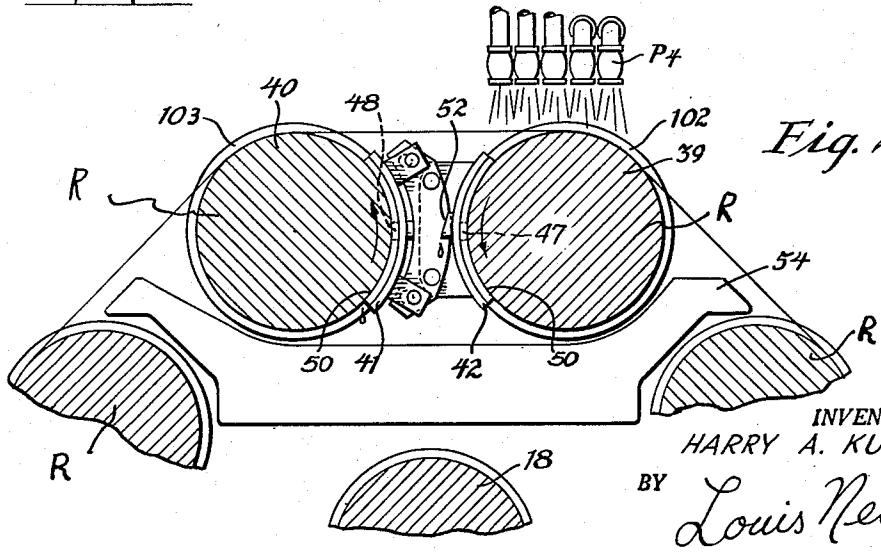


Fig. 2.



INVENTOR.
HARRY A. KULJIAN
BY Louis Necho
ATTORNEY.

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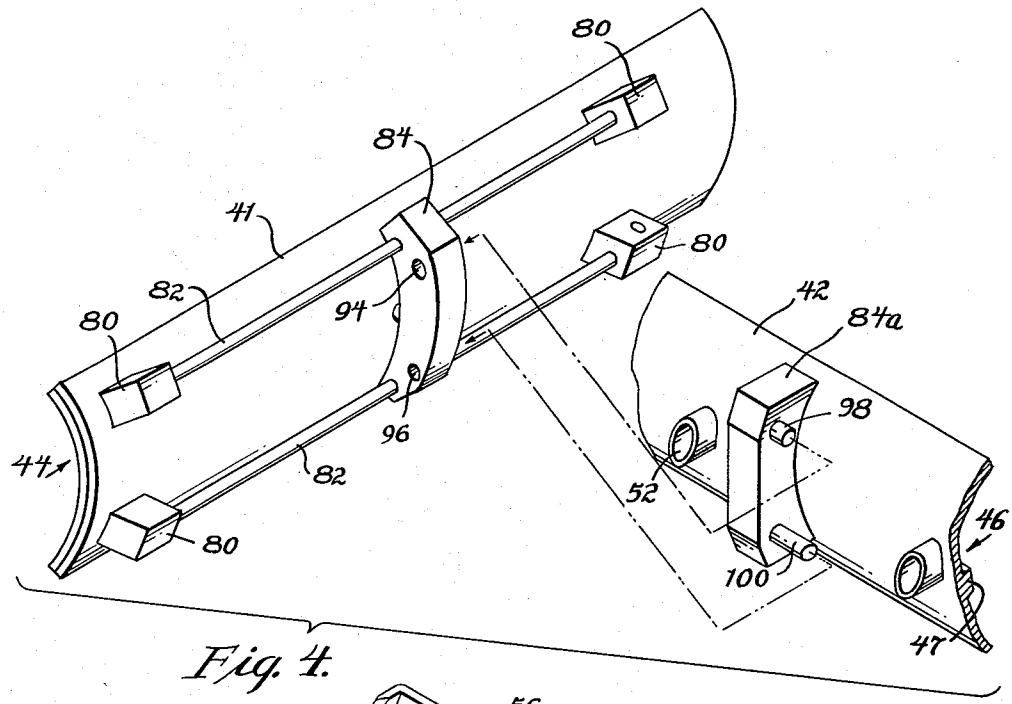


Fig. 4.

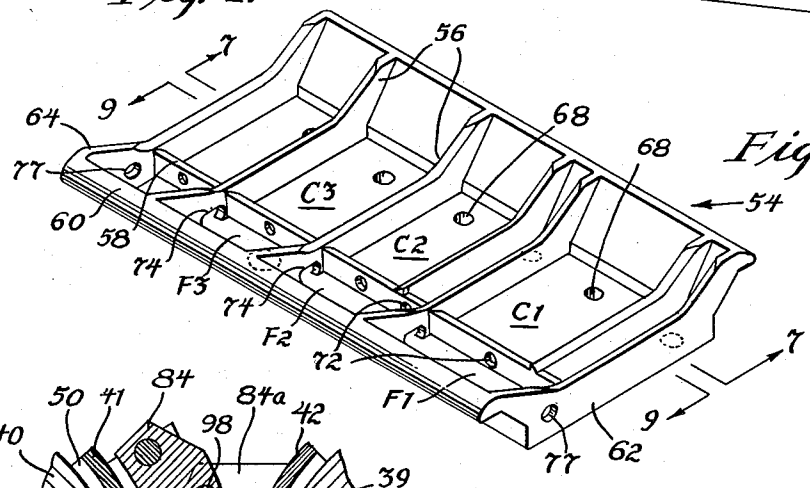


Fig. 5.

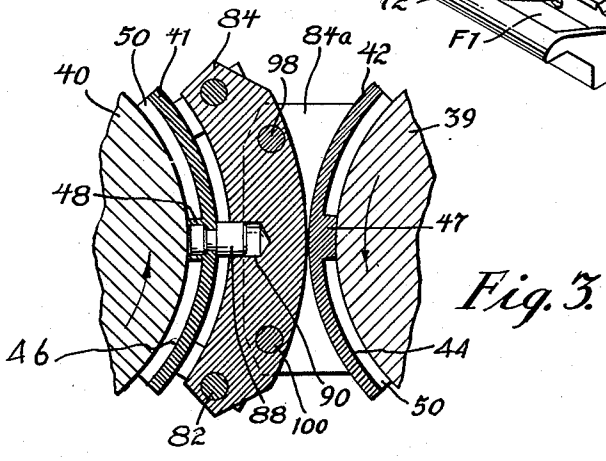


Fig. 3.

INVENTOR.
HARRY A. KULJIAN
BY Louis Necho
ATTORNEY.

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MEANS FOR DETACHABLY MOUNTING SCRAPERS BETWEEN TWO ADJACENT ROLLS

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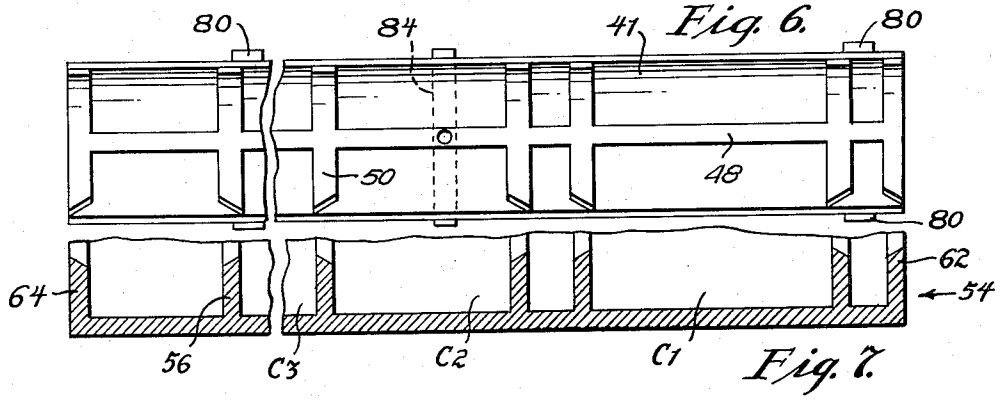


Fig. 6.

Fig. 7.

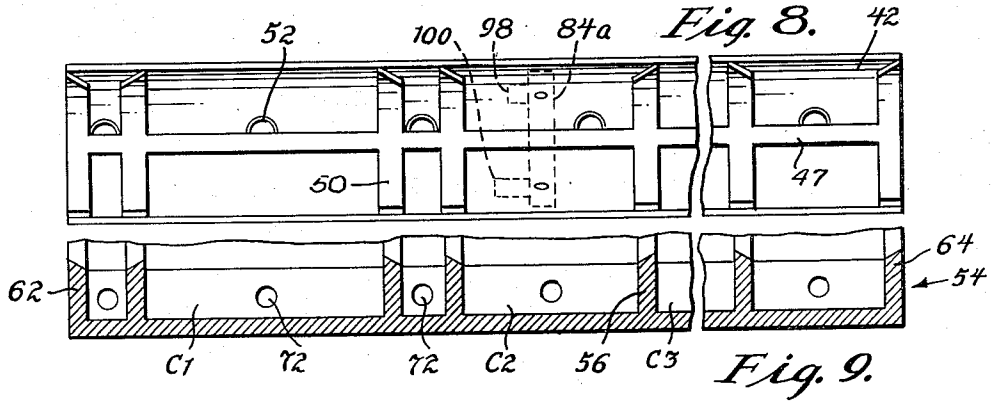


Fig. 8.

Fig. 9.

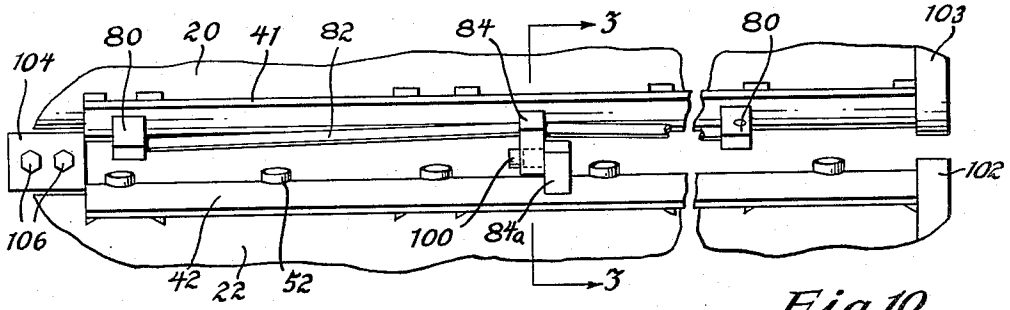


Fig. 10.

INVENTOR.
HARRY A. KULJIAN
BY Louis Necko
ATTORNEY.

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MEANS FOR DETACHABLY MOUNTING SCRAPERS BETWEEN TWO ADJACENT ROLLS

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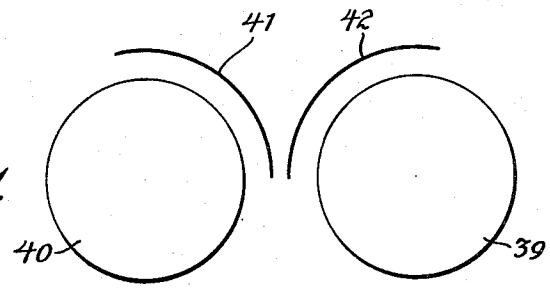


Fig. 11.

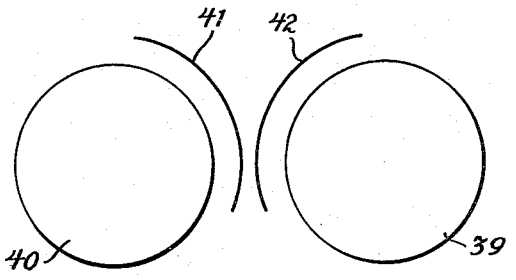


Fig. 12.

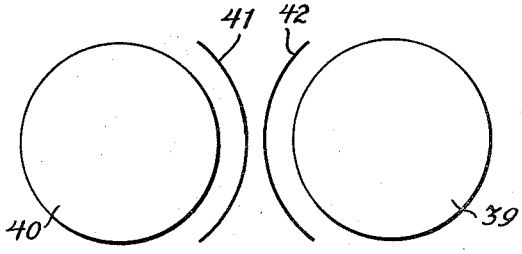


Fig. 13.

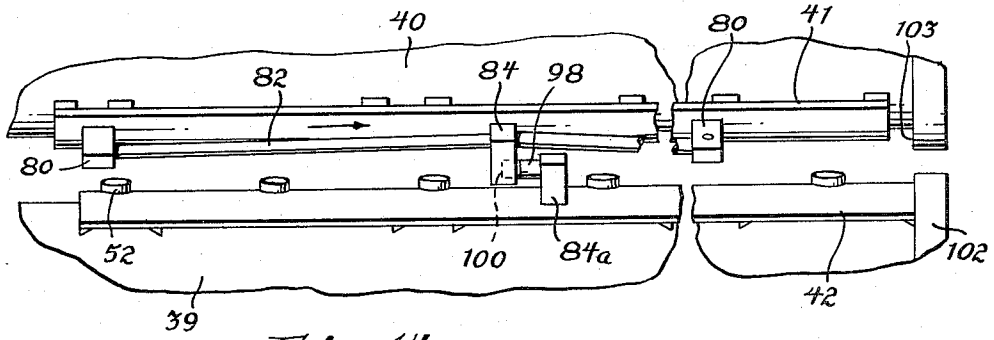


Fig. 14

INVENTOR.
HARRY A. KULJIAN
BY Louis Necko
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,690,068

MEANS FOR DETACHABLY MOUNTING SCRAPERS BETWEEN TWO ADJACENT ROLLS

Harry Asdour Kuljian, Merion, Pa.

Application January 2, 1953, Serial No. 329,403

8 Claims. (Cl. 68—205)

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In the manufacture, or in the processing, of synthetic filaments, the filament is caused to move longitudinally of a thread storing and advancing reel formed of a plurality of rotating rolls, and various liquid re-agents are poured over the filament as it passes through successive zones along one or more of the rolls.

In order to make sure that the various liquids needed are present in sufficient quantities, and because it is difficult, if not impossible to gauge the liquid requirements exactly, it is the practice to supply the various liquids in relatively excessive amounts. But, because at least some of the liquids used are expensive, because the presence of liquids in excessive quantities will result in excessive intermingling of the various liquids delivered to adjacent zones on the roll with obviously undesirable consequences, and because the presence of an excessive quantity of one reagent or another may, of itself, produce undesired results, it is desirable to remove excess liquids so as to regulate the quantities of the various liquids which are allowed to remain on the filament or on the rolls during movement of the filament through successive zones along such roll. It is also desirable that the excess liquids be removed, as far as possible, in a segregated manner so as to facilitate reclamation and reconcentration of the various liquids.

A further object is to produce an improved scraping and segregating device which will be inexpensive to make and easy to install or remove.

A still further object is to provide improved means for mounting and demounting the scraping and segregating means referred to.

A still further object is to produce an improved trough for receiving the various liquids scraped off the rolls and for disposing of said liquids in combined or in segregated manner.

These and other objects are attained by my invention as set forth in the following specification and as shown in the accompanying drawings in which—

Fig. 1 is a fragmentary and diagrammatic view of a thread manufacturing or thread processing means embodying the invention, certain parts being omitted.

Fig. 2 is an enlarged, fragmentary, sectional view, looking in the direction of line 2—2 on Fig. 1.

Fig. 3 is an enlargement of the upper central portion of Fig. 2 better to show the details of construction.

Fig. 4 is a composite, perspective view of the

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combined liquid scrapers and segregators, looking at the convex sides thereof.

Fig. 5 is a perspective view of the liquid receiving trough.

Fig. 6 is an elevational view of the concave side of one of the liquid scrapers and segregators shown in Fig. 4.

Fig. 7 is a sectional view loking in the direction of line 7—7 on Fig. 5.

Fig. 8 is an elevational view of the concave side of the other of the liquid scrapers and segregators shown in Fig. 4.

Fig. 9 is a sectional view looking in the direction of line 9—9 on Fig. 5.

Fig. 10 is a fragmentary top plan view of Fig. 2.

Figs. 11, 12 and 13 are highly diagrammatic views showing the first three steps of inserting the liquid scrapers and separators between the uppermost rolls of the reel.

Fig. 14 is a top plan view showing how the parts appear after completion of the fourth step of assembly.

The apparatus illustrated includes a filament advancing and storing reel formed of a plurality of rolls R, usually eight in number, which are equally spaced around a fixed central support 18. These rolls, only the upper two of which have been shown in Figs. 2, 3, 10 and 14, have their axles journalled for rotation in self aligning bearings (not shown) formed in, or carried by, opposite end plates 24 and 26. The self aligning bearings referred to may be of any standard type, it being only necessary that the bearings in at least end plate 26 be such as to provide a little play for the axles journalled therein. The rolls are rotated about their axes by motor M, the shaft of which carries a gear, not shown, which meshes with gears, not shown, on the adjacent ends of the axles of the rolls. Since the rolls may be rotated in any desired manner, and since the means for rotating the rolls forms no part of the present invention, the manner in which the rolls are rotated is not shown or described in detail. It is sufficient to point out that all the rolls are rotated at the same speed by a single central gear.

The end plates 24 and 26 are supported by the fixed central support 18 which is in turn supported by a suitable frame 28, so that the filament advancing and storing reel is mounted in cantilever fashion. The end plate 24 is rotatable relative to the end plate 26 so as to skew the axis of the rolls relative to the axis of central support 18 or to an imaginary central horizontal axis, whereby, when the rolls are rotated and when a

filament 30 is wound about the supported, or right hand end, of the reel, the filament will move in the form of a helix from the supported to the unsupported end of the reel. This can be done by loosening nut 25 and turning end plate 24 through a very small angle. Since this arrangement, too, forms no part of the present invention, it is not described in detail.

The filament 30 may be in the nature of a freshly coagulated strand in which case it is produced by extruding an appropriate solution, under pressure, through a spinnerette 32 into a suitable coagulating bath 34, or it may be in the nature of an already-formed filament fed to the reel from a spool or other source, not shown. The freshly coagulated filament is passed over one or more godet wheels 38, in any desired manner, and for the usual purpose.

In order to complete the regeneration of a freshly coagulated filament, or in order to process an already formed filament, various conventional and well known liquid re-agents such as acid and alkali solutions, soaps, water, etc. are applied to the filament as it moves longitudinally of the reel. In Fig. 1 there are shown a number of pipes, P1, P2, P3, P4, P5, P6, etc., which are arranged to deliver the respective treating liquids to the filament as it passes through successive zones on upper roll 39. It will be noted that the pipes stop short of the left hand end of the reel so as to provide an end drying zone in which any suitable heating means may be installed for drying the filament.

In order to remove excess liquids from roll 39 and adjacent roll 40, and in order to minimize intermingling of the liquids delivered to adjacent zones, I provide the combined liquid scrapers and separators of the type shown in my Patent No. 2,634,449 of April 14, 1953. Essentially, and as best shown in Figs. 3 and 4, these comprise curved shells 41 and 42 which are adapted to be placed back-to-back with their respective concave surfaces 44 and 46 facing the adjacent uppermost rolls 39 and 40 respectively. The concave surfaces of these shells are provided with central, longitudinal strips 47 and 48 and with a plurality of transverse strips 50. The strips 47, 48 and 50 contact the adjacent rolls and are thus subject to wear. Therefore, they are made of a material softer than the material of the shell and they can be made readily detachable. The horizontal strips 47 and 48 are intended to scrape liquid off the entire surface of each roll and the transverse strips 50 are intended to minimize the intermingling of the different liquids supplied by the respective pipes P1, P2, P3, etc. To this end the strips 50 are so spaced that, when they contact the respective rolls, they define zones of the desired length which register with the pipes P1, P2, P3, etc.

As shown in Figs. 2 and 3, rolls 39 and 40 rotate in a counterclockwise direction. Therefore, liquid scraped off roll 39 by horizontal strip 47 on shell 42 will collect above that strip while liquid scraped from roll 40 by horizontal strip 48 on shell 41 will collect below that strip.

To remove liquids scraped off by strip 47 on shell 42 I provide spouts 52 which pass through shell 42, above the horizontal strip 48, there being at least one such spout between each pair of juxtaposed vertical strips 50. The liquids scraped off roll 40 by strip 48 drain down the inner surface of the shell and need no spouts 52.

The liquids thus collected are emptied into a trough 54. This trough, which is supported below rolls 39 and 40 in any suitable manner, has its interior divided by partitions 56 into separate compartments C1, C2, C3, etc. These compartments are further divided by longitudinal wall 58 to provide small compartments F1, F2, F3, etc. formed between the longitudinal wall 58 and the front wall 60 of the trough. The compartments C1, C2, C3, etc. are so arranged as to register with the spaces between adjacent transverse strips 50. It should be noted that the thickness of partitions 56 is less than the width of the corresponding transverse strips 50 so as to ensure that all of the liquid draining down the juxtaposed faces of adjacent transverse strips will be deposited in the particular compartment I in which it is intended to be received.

If the liquids are to be recovered separately, for reclamation and reuse, they are run off through corresponding drain orifices 68 located in the bottom walls of the compartments C1, C2, C3, etc.

Compartments C1, C2, C3, etc. communicate, through orifices 72, with corresponding compartments F1, F2, F3, etc. and compartments F1, F2, F3, etc. communicate with each other through orifices 74. With this arrangement of orifices 68, 72 and 74 it is possible to dispose of any, or of all, of the liquids through a common drain and it is possible to collect selected liquids separately for reclamation and reuse. For example, if an acid, or an alkali, solution is drained into compartment C1, corresponding orifice 72 is closed and the acid is drained through orifice 68 from compartment C1 to a point of reclamation. If wash water is drained into compartment C2, for example, corresponding outlet 68 is closed and orifice 72 leading to compartment F2 is opened. The wash water thus flows from compartment C2 into compartment F2 and through orifices 74 to be drained through outlet 77 in either end wall of the trough. This provides extreme flexibility of operation by selectively closing or opening one or another of the orifices between the compartments C and the F compartments, the various liquids can be discarded or reclaimed as desired.

To provide for easy mounting and demounting of the shells 41 and 42, I provide the following arrangement:

The convex outer surface of shell 41 is provided with spaced lugs 80, for supporting spring rods 82 which also pass through an arcuate lug 84. The lug 84 is secured to the convex outer surface of shell 41 by a pin 88 which is carried by the convex side of shell 41 and which engages an opening formed in the concave side of lug 84. Likewise shell 42 is provided with a similar lug 84*a* which corresponds in size and shape to member 84 and which is attached to shell 42 by any suitable means.

The lug 84 on shell 41 is provided with an upper hole 94 and a lower hole 96, and the corresponding lug 84*a* on to shell 42 is provided with an upper short pin 98 and a lower long pin 100 adapted to engage the holes 94 and 96 respectively.

In assembling the shells 41 and 42, they are first placed back to back and the lower, and longer, pin 100 on lug 84*a* is only partially inserted into lower hole 96 in lug 84. The two shells are thus pivotally joined and, with the upper short pin 98 free of its corresponding hole 94, the lower edges of the two shells, as viewed in Fig. 2, are brought together and inserted

downwardly between rolls 39 and 40, as hereinafter explained.

Because the shells are of the same length and because pin 100 is only partly inserted in hole 96, it follows that the shells 41 and 42 will not coincide, longitudinally speaking. Therefore, when the right hand end of shell 42 abuts collar 102 on roll 39, as shown in Fig. 14, the corresponding end of shell 41 will be spaced from the collar 103 on roll 40. If shell 41 is now moved in the direction of the arrow in Fig. 14 until it abuts collar 103, the short pin 98 will enter hole 94 to lock the shells together back to back as shown in Fig. 2.

The shells are held against longitudinal movement relative to the reel by means of a stop plate 104 which is inserted between rolls 39 and 40 and secured by bolts 106 to a bracket or other support, not shown, carried by the center post or by the frame of the machine.

The manner in which the shells are mounted, and demounted, is shown in Figs. 11 to 14. From these figures it will be seen that when the shells are hinged together only by means of the lower, long pin 100 engaging lower hole 96, the shells can be pivoted or rotated through a relatively wide angle. To begin inserting the hinged shells between the rolls 39 and 40, they are first placed in the position of Fig. 11 in which their lower edges are relatively close together so as to pass through the nip between the rolls. As the shells move downwardly, their upper edges are slowly rotated in the reverse direction, until they reach the positions of Figs. 12 and 13.

The shells 41 and 42 will now be so related that the short upper pin 98 will be in alignment with the upper hole 94 and in which shell 41 is longitudinally staggered with respect to shell 42. In other words shell 42 abuts collar 101 while shell 41 does not abut collar 103. At this point, shell 41 is pushed until it abuts collar 103 until it is in longitudinal alignment with shell 42. Stop plate 104 is lowered between rolls 39 and 40 and secured in the position shown in Fig. 10 in which it abuts the edges of shells 41 and 42 and prevents longitudinal movement thereof.

To demount the liquid scrapers and segregators, the stop plate 104 is removed, shell 41 is longitudinally of shell 42 to detach upper pin 98 from upper hole 94. This permits rotation of the shells about lower pin 100 in a direction to bring the lower edges close together so as to pass upwardly through the nip of the rolls. By this means, the liquid scrapers and separators are locked firmly in position and can be mounted or demounted, easily, quickly and without in any way disturbing the reel itself.

In their assembled position, the lug 84a on shell 42 abuts, and slightly bends, spring rods 82 whereby the shells are biased in opposite directions into engagement with rolls 39 and 40. The action of the spring insures that the scraping horizontal strips 47, 48 and, vertical segregating strips 50 will contact the rolls with a following pressure.

What I claim is:

1. The combination with a thread treating apparatus of the type which includes a number of elongated rolls arranged to form a reel adapted to receive a thread to be treated, means for supplying various treating liquids to said filament in successive zones along said reel, and spaced scrapers disposed transversely of the axis of the reel in abutting relationship with the surface

of at least one of said rolls, the spacing of said scrapers being such that the spaces between adjacent scrapers correspond to said zones, of a trough located below said scrapers and said roll and having a main compartment and an auxiliary compartment corresponding to each of said zones, each of said main compartments being so located as initially to receive the liquid from the zone thereabove, there being a drain opening leading from each of said main compartments to a point of disposal, and a passage leading from said main to said auxiliary compartment whereby, by closing said drain opening and opening said passage the liquid will flow from said main compartment to said auxiliary compartment and whereby, by closing said passage and opening said drain opening the liquid will flow to said point of disposal.

2. The structure recited in claim 1 in which said auxiliary compartment also has a drain leading to another point of disposal.

3. A thread treating apparatus including a plurality of elongated rolls arranged to form a reel about which a thread to be treated is wound, means for supplying various treating liquids to the thread in successive zones along said reel, a pair of arcuate shells, scrapers on the concave face of each of said shells, and mounting means for removably mounting said shells between two juxtaposed rolls of said reel with said scrapers abutting said rolls, respectively, and with the convex faces of said shells in juxtaposition, said means including a first fastening means capable of pivotally connecting said arcuate shells together in a manner to permit movement of the longitudinal edges thereof toward each other, for initial insertion of said edges between said rolls, and for permitting subsequent rotation of the shells in opposite directions after the shells are in their desired position between the rolls, and a second fastening means for locking said shells against further relative rotation.

4. The structure recited in claim 3 in which said first fastening means includes juxtaposed lugs carried by the convex faces of said shells, there being an opening in one of said lugs, and a pin carried by the other of said lugs and adapted to engage said opening.

5. The structure recited in claim 3 and a third fastening means for locking both of said shells against longitudinal movement relative to said rolls.

6. The structure recited in claim 3 and means carried by at least one of said shells for exerting following pressure against said shells in the direction of their respective rolls.

7. A thread treating apparatus including a plurality of elongated rolls arranged to form a reel about which a thread to be treated is found, means for supplying various treating liquids to the thread in successive zones along said reel, a pair of transversely arcuate shells, scrapers on the concave face of each of said shells, and mounting means for removably mounting said shells between two juxtaposed rolls of said reel with said scrapers abutting said rolls, respectively, and with the convex faces of said shells in juxtaposition, said means including a first lug on the convex side of one of said shells, a second lug on the convex side of the other shell, a relatively long pin on one side of one of said first lugs, there being a hole in the corresponding side of said second lug adapted to receive said long pin, a relatively short hole on said side of said second lug adapted to be engaged by said short pin,

whereby partial insertion of said long pin into its corresponding hole will rotatably hinge the shells together with the ends of said shells out of registration with each other and whereby, relative longitudinal movement of said shells to engage said short pin in its corresponding hole, will bring the ends of said shells into registration with each other and will lock said shells against relative rotation.

8. The structure recited in claim 7 and means affording a fixed abutment for the joined shells at one end thereof, and a detachable locking plate adapted to abut the other end of the joined shells to prevent longitudinal movement of said shells relative to said rolls.

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