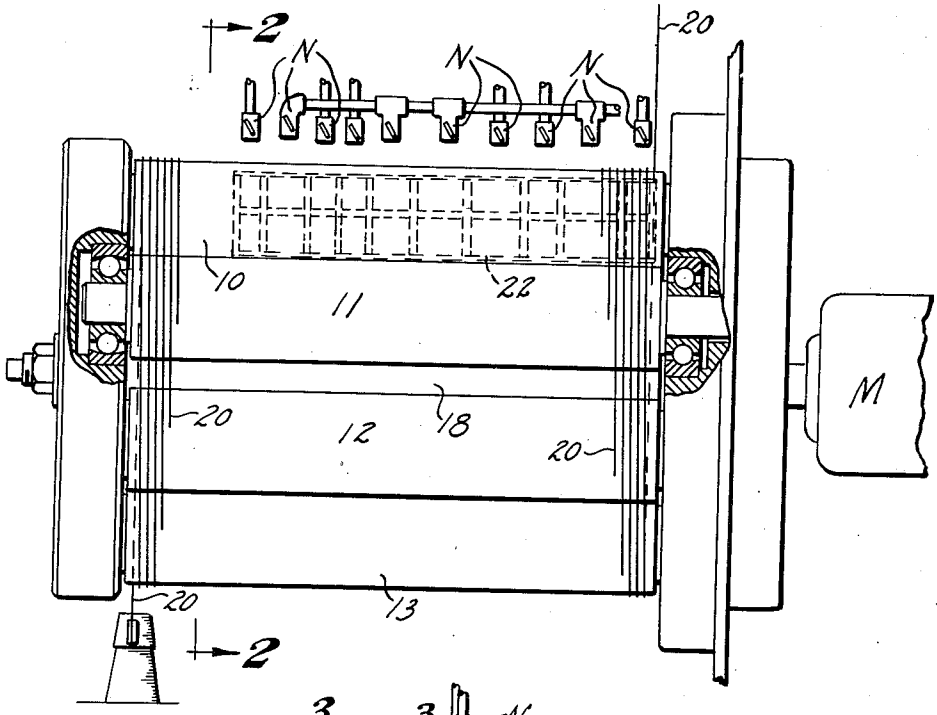
Nov. 16, 1954 H. A. KULJIAN 2,694,308

APPARATUS FOR TREATING YARN WITH LIQUIDS

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Fig. 1



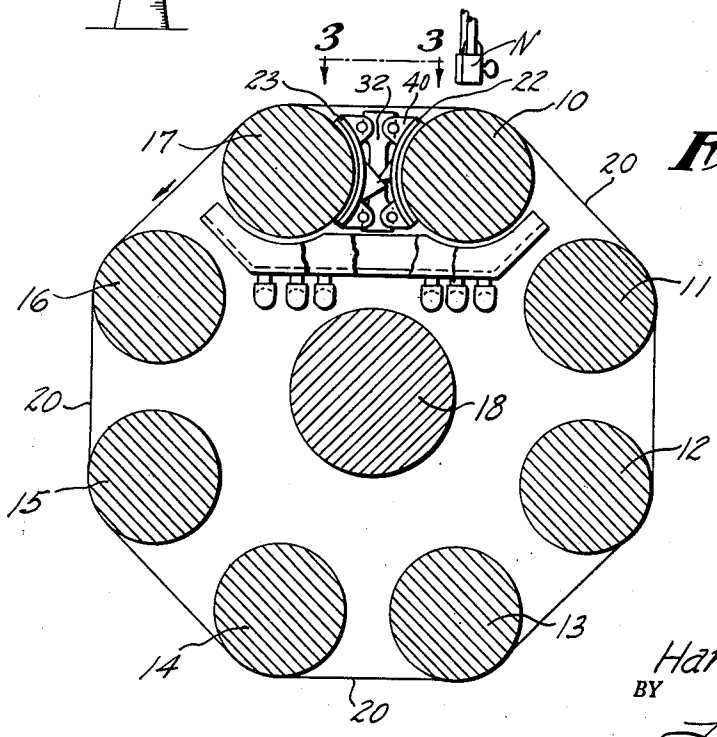




Fig. 2

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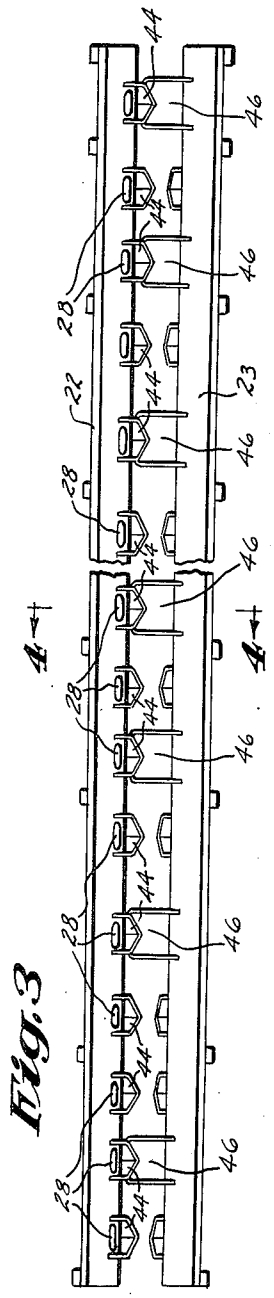


Fig. 3

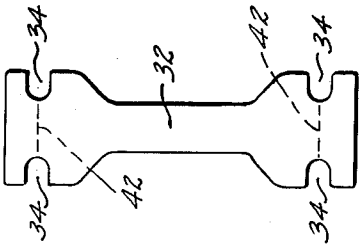


Fig. 5

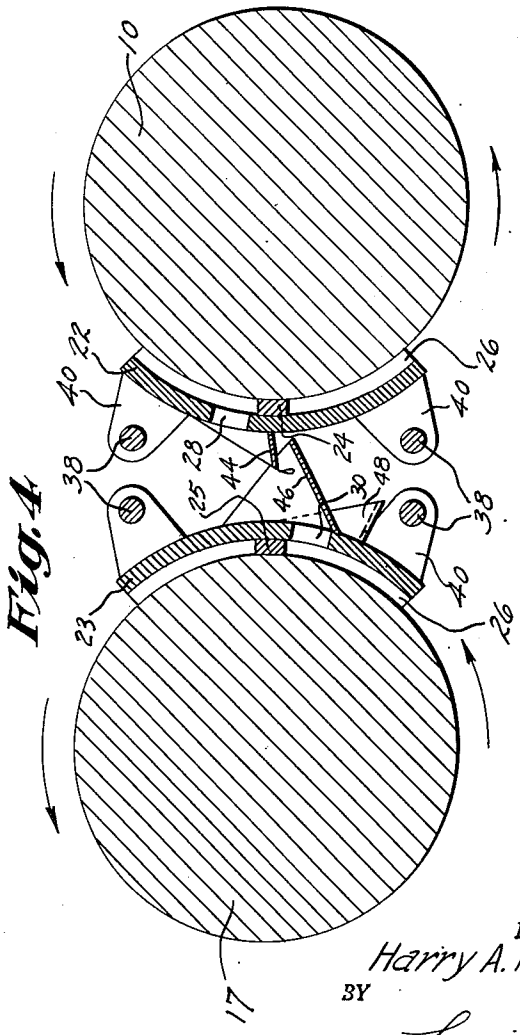


Fig. 4

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Fig. 6

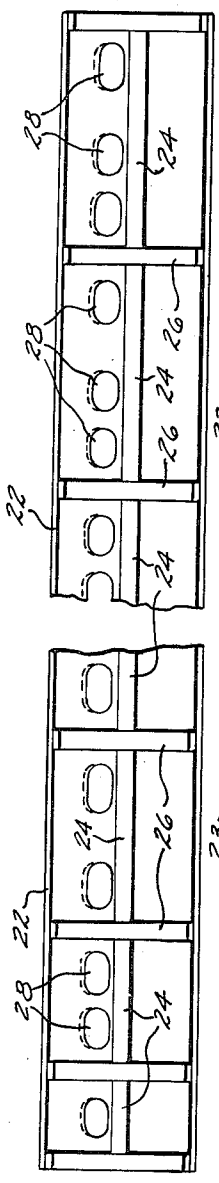


Fig. 8

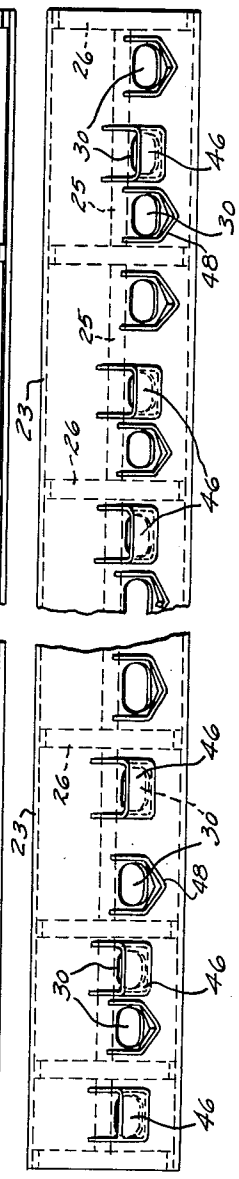


Fig. 7

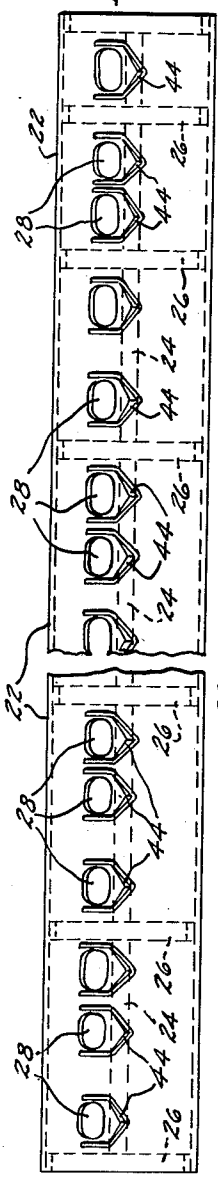
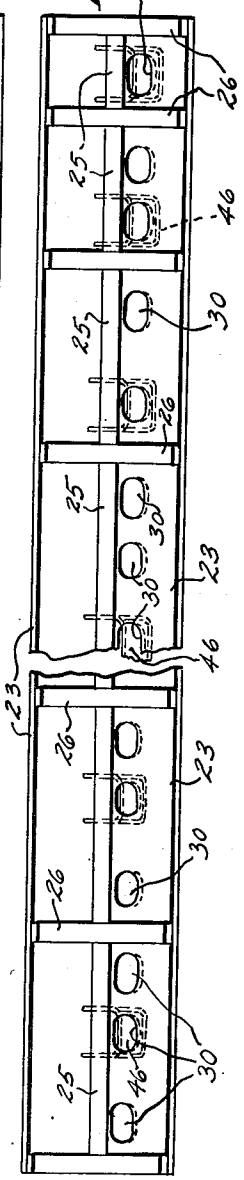


Fig. 9



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2,694,308

Patented Nov. 16, 1954



2,694,308

# APPARATUS FOR TREATING YARN WITH LIQUIDS

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Application May 7, 1951, Serial No. 224,920

1 Claim. (Cl. 68—205)

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 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 re-agent 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.

To these ends, I have provided an improved, combined scraping or wiping and segregating device whereby excess liquids can be removed, in a segregated manner, from the surface of the roll to which the liquids are supplied and from the surface of at least one adjacent roll.

In practice, it is necessary to start rotating the rolls before the filament is wound about the feed end of the reel. Therefore, even though the treating liquids are being supplied to one of the rolls, the remaining rolls will run dry until the thread helix formed about the reel begins to carry liquid from the roll to which the liquids are supplied to the other rolls of the reel. Rotation of a dry roll against a wiper will result in wear on both the roll and the wiper. In actual installations, a plurality of reels will be driven by a single prime mover and, since all the reels can not be threaded at the same time, some of the reels will run dry for longer or shorter intervals.

It is therefore the object of this invention to produce an improved reel in which the rolls which are provided with wipers are almost immediately wetted and lubricated whereby the wear which would result from the rolls running dry against their wipers is greatly reduced or entirely eliminated.

A further object is to accomplish the foregoing object without having to apply treating liquids to all rolls which are provided with wipers and without in any way interfering with the function of the wipers themselves.

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 side elevational view of an improved reel embodying the invention.

Fig. 2 is a section on line 2—2 on Fig. 1.

Fig. 3 is a top plan view looking in the direction of line 3—3 on Fig. 2, everything being omitted except the wipers which act on the uppermost two rolls.

Fig. 4 is a greatly enlarged sectional view on line 4—4 on Fig. 3 better to show details of construction.



Fig. 5 is side elevational view of a key-like member used for keeping the wipers in effective position.

Fig. 6 is a side elevational view of the concave side of the right hand wiper as shown in Fig. 4.

Fig. 7 is a side elevational view of the convex side of this wiper.

Fig. 8 is a side elevational view of the convex side of the left hand wiper as shown in Fig. 4.

Fig. 9 is a side elevational view of the concave side of this wiper.

The reel illustrated includes a number of rolls 10, 11, 12, 13, 14, 15, 16 and 17 which are arranged in the form of a circle around a fixed center post 18. The rolls are rotated about their individual axes by means of gears, not shown, which are driven by means of a motor M. The axes of the rolls are skewed with reference to the axis of the post 18 so that, when a thread 20 is wound about one end of the reel, it will move longitudinally of the reel, in the form of a helix circumscribing all of the rolls.

As the thread moves axially of the reel, it is supplied with various liquids calculated to complete the regeneration of a nascent synthetic thread and/or to impart the desired finish to the thread. The liquids referred to are delivered from various nozzles N which are spaced to correspond to spaced treating zones along the reel. The nozzles are in alignment with one of the upper rolls, such as roll 10 and, in order to insure adequate treatment of the thread, the liquids are initially supplied in excessive quantities. But in order to remove the excess quantities of the various liquids separately for reclamation, in order to guard against the continued presence of excess quantities of liquids which may adversely affect the processing of the thread, and in order to facilitate the drying of the thread, I provide wipers or scrapers for removing excess liquids from roll 10, onto which the liquids are directly supplied, and from at least adjacent roll 17 to which relatively large quantities of liquids are carried by movement of the thread as indicated by the arrows in Fig. 2.

The wipers shown are disclosed and claimed in my patent No. 2,634,449 of April 14, 1953 and entitled Thread Manufacturing Apparatus. In view of this, it is now necessary to describe only so much of the structure of the wipers as is required for a proper understanding of the present invention.

As will be best seen from Figs. 4, 6 and 9, the wipers, respectively, include elongated, transversely curved shells 22 and 23, on the concave side of each of which are horizontal strips 24 and 25 and a number of spaced, vertical strips 26. The strips 24 and 25 serve to remove excess liquids from the surfaces of rolls 10 and 17 and the vertical strips 26 serve to minimize the flow of liquids from the portions of the rolls between such strips to adjacent portions. The excess liquids thus removed are discharged through openings 28 in shell 22 and through openings 30 in shell 23. Because rolls 10 and 17 rotate in the direction of the arrows in Fig. 4, the openings 28 are above horizontal strip 24 and openings 30 are below strip 25.

The wipers are held in position by means of the member 32, shown in Fig. 5. This member is provided with upper and lower recess 34 which are adapted to engage upper and lower elongated springs 38 which extend longitudinally of the convex sides of shells 22 and 23. The springs are supported by spaced lugs 40. As will be seen from Fig. 4, the space between the inner peripheries of spring 38 is less than the width of the member 32 measured along broken line 42 which connects the inner peripheries of recesses 34. Therefore, when the member 32 is in the position of Fig. 2, with the springs 38 in recess 34, the springs will be loaded and will exert a yielding pressure against the shells 22 and 23 to cause the strips 24 and 25 and the strips 26 to engage the rolls 10 and 17 with yielding pressure.

With the structure above described, if liquid is supplied to roll 10 and if the rolls are rotated in the absence of a thread on the reel, the roll 17, which also has a wiper, will run dry. Also, the reel must rotate before and during the winding of a thread thereon and therefore

a progressively decreasing portion of roll **17** will run dry. The first situation results in overall wear of roll **17** (due to scraping against strip **25**) and the second situation results in progressively greater wear of roll **17** as the discharge end of the reel is approached. In practice, when many reels are driven as a unit, quite some time will elapse before threads are completely wound about all of the reels and it is sometimes necessary, for some reason or other, to run the reels, for longer or shorter intervals, without any threads.

To overcome this difficulty, I provide a selected number of openings **28** with spouts **44** and I provide some of the corresponding openings **30** in shell **23** with scoops **46**, which underlap spouts **44** as best shown in Fig. 4. By this arrangement, liquids scraped off roll **10** by strip **24** will be discharged, by spouts **44** into scoops **46** and, therefore, roll **17** will be immediately wetted and, hence, lubricated, even in the absence of a thread on the reel. The lubrication of roll **17** thus guards against dry running and consequent wear on this roll and it improves the lacing of the thread, or the formation of a helix about the reel. Thus, if roll **17** is dry when the thread first reaches it after leaving roll **10**, it might adversely affect the uniform spacing of the convolutions of the helix and effective tension or friction with which the thread convolutions engage the reel. The liquids scraped off from roll **17** are discharged through spouts **48**, which communicate with openings **30**. In other words, when liquids are first poured on roll **10**, some of the liquids scraped off this roll are delivered through openings **28**, spouts **44**, scoops **46** and openings **30**, to the concave surface of shell **23** so that, by splashing, or by surface tension of the liquids, roll **17** will be wetted in advance of the arrival of the wet thread thereon. On the other hand, when the reel is in operation and the thread carries a large



amount of liquid onto roll **17**, the excess liquid scraped by strip **44** will pass through openings **30** and out through the lower, downwardly sloping spouts **48**. As will be seen from Fig. 3, scoops **46** are used only at intervals and that where they are not used, spouts **48**, alone, communicate with openings **30**. This is clearly shown in Fig. 8. Except for the addition of the scoops **46**, the present structure is the same as that shown in my Patent 2,634,449 aforesaid.

What I claim is:

A combined wiper and lubricator mechanism for use on a thread storing and advancing reel of the type which includes at least two elongated rolls about which the thread is adapted to travel and means for applying treating liquids to the thread as it moves over one of said rolls, said mechanism including a first shell adapted to be placed adjacent the roll to which the liquids are supplied, a scraper carried by said first shell for removing excess quantities of said liquids from the surface of said roll, there being openings in said first shell through which the liquids removed from said roll are discharged, spouts leading from said openings, a second shell adapted to be placed adjacent the other of said rolls, there being openings in said second shell, and scoops carried by said second shell and leading from the openings therein to said spouts for receiving the liquids discharged through the openings in said first shell to wet the other of said rolls.

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