June 19, 1956 H. A. KULJIAN 2,750,783

THREAD MANUFACTURING APPARATUS

Filed Dec. 4, 1953 2 Sheets-Sheet 1

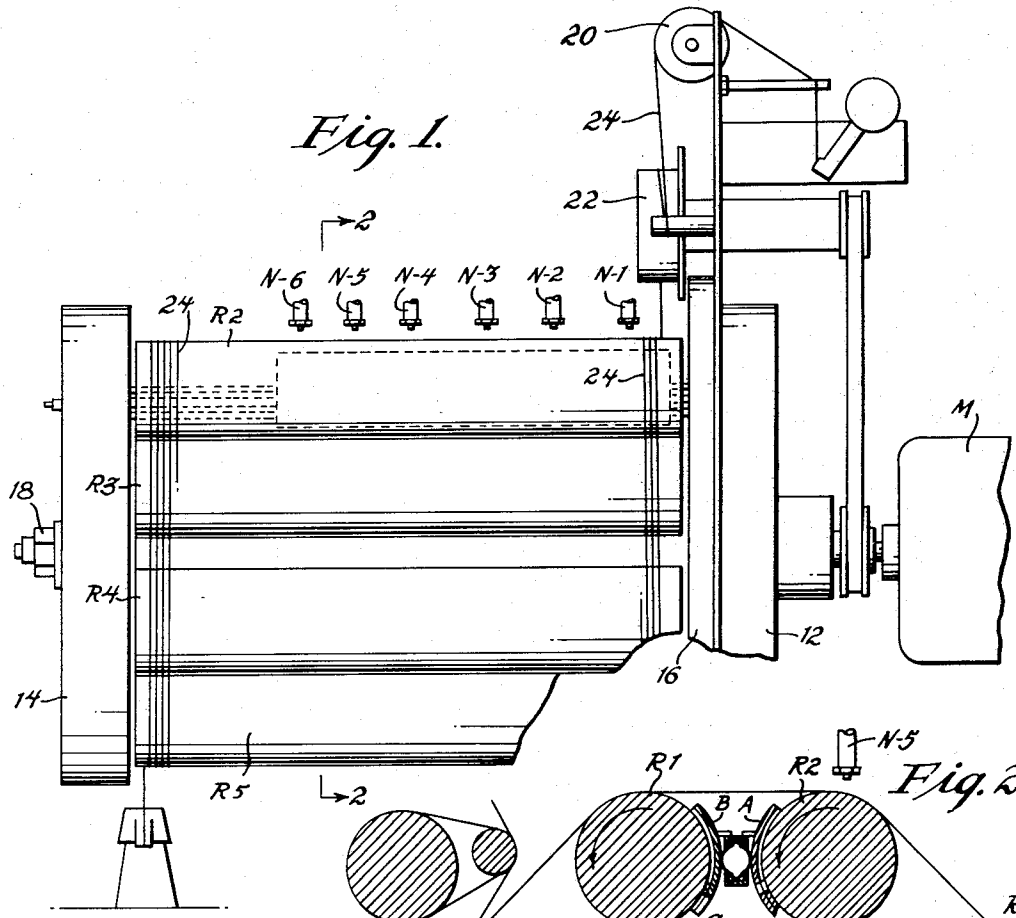


Fig. 1.

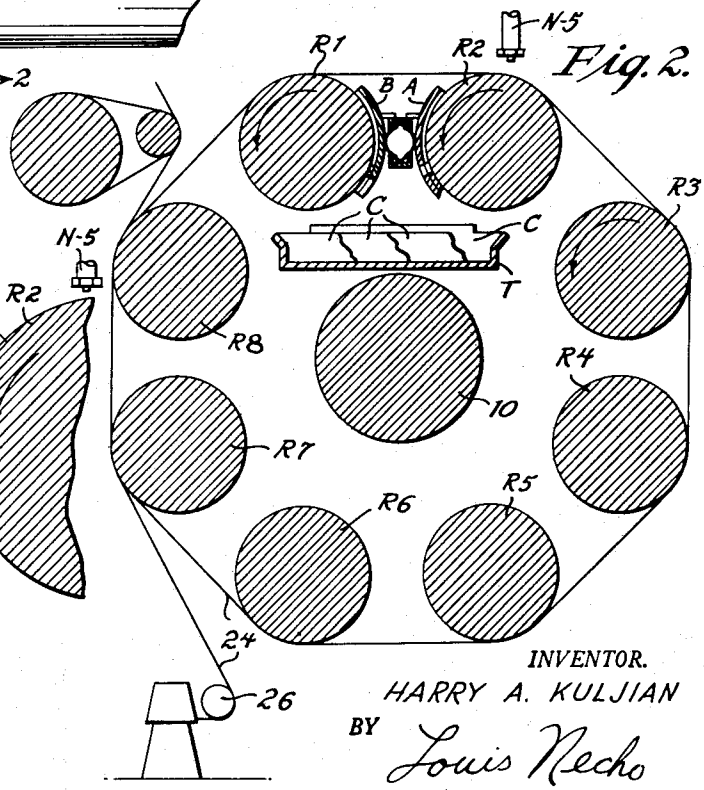


Fig. 2.

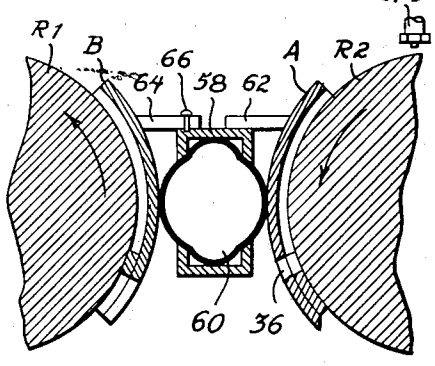


Fig. 3.

INVENTOR.
HARRY A. KULJIAN
BY Louis Necho
ATTORNEY.

June 19, 1956 H. A. KULJIAN 2,750,783

THREAD MANUFACTURING APPARATUS

Filed Dec. 4, 1953 2 Sheets-Sheet 2

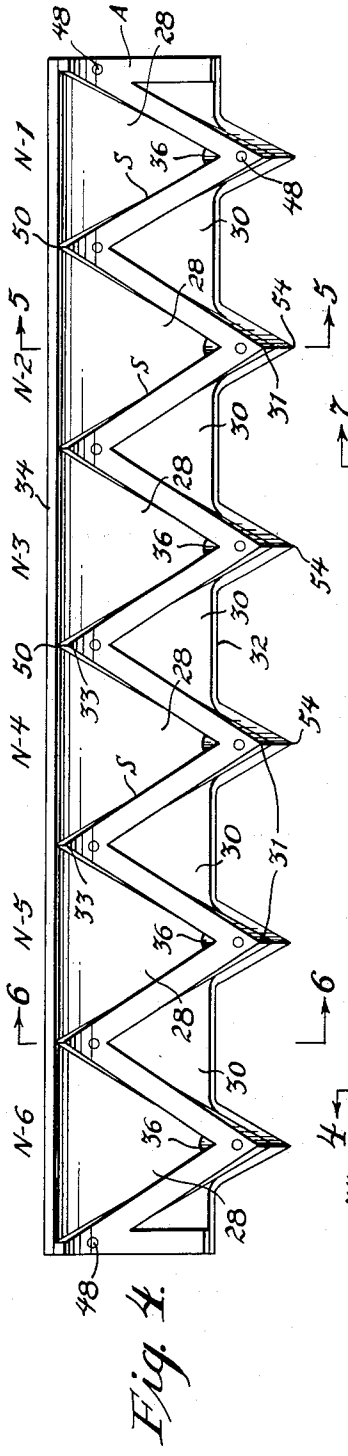


Fig. 4.

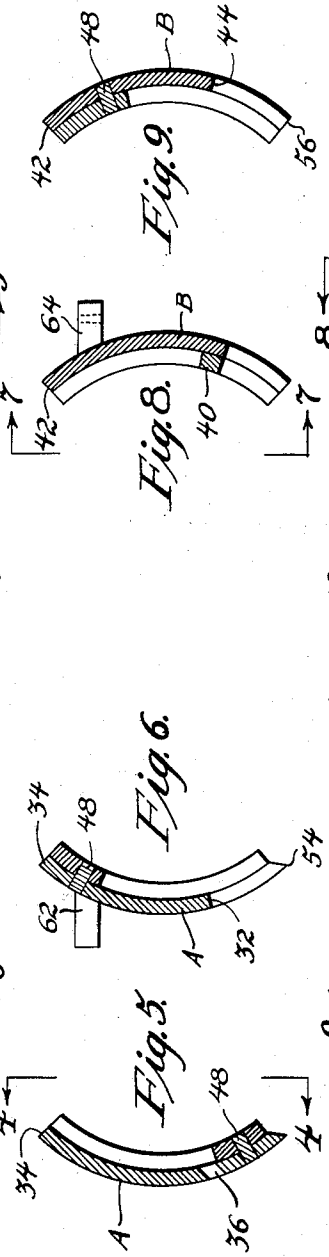


Fig. 5.

Fig. 6.

Fig. 8.

Fig. 9.

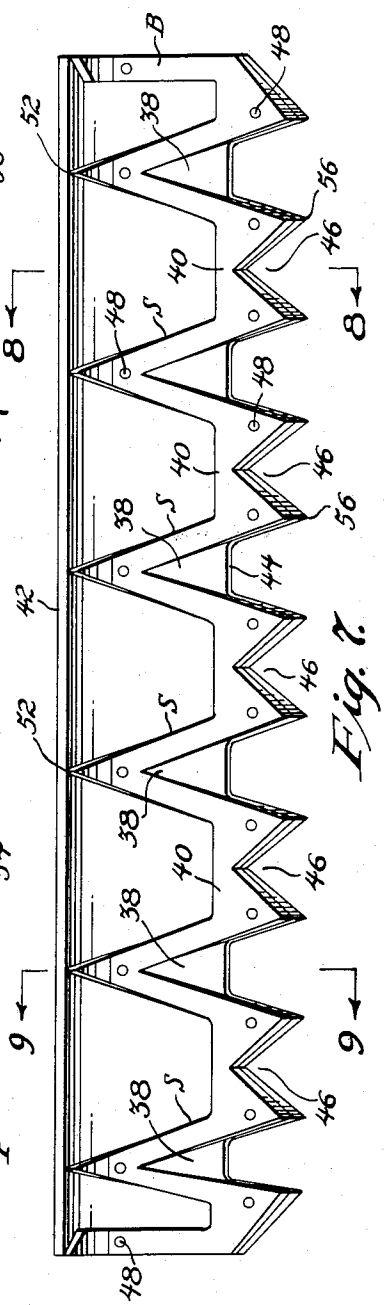


Fig. 7.

INVENTOR.
HARRY A. KULJIAN
BY Louis Necho
ATTORNEY.

United States Patent Office 2,750,783 Patented June 19, 1956

2,750,783

THREAD MANUFACTURING APPARATUS

Harry A. Kuljian, Merion, Pa.

Application December 4, 1953, Serial No. 396,113

6 Claims. (Cl. 68—205)

This invention relates to a thread manufacturing apparatus of the type shown in my prior Patent No. 2,634,449 of April 14, 1953, entitled Thread Manufacturing Apparatus.

In the patent referred to, there is disclosed a wiper, or scraper, for removing some of the excess liquids from that portion of a roll which is not engaged by the thread being manufactured or processed.

The object of the present invention is to produce an improved wiper or scraper of the type shown in said prior patent for use in connection with an apparatus of the general type disclosed in said prior patent and in several other prior patents issued to me.

The full nature of the invention will be understood from the following specification and the accompanying drawings in which:

Fig. 1 is a fragmentary and diagrammatic view of a thread manufacturing apparatus embodying my invention.

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

Fig. 3 is an enlargement of the upper central portion of Fig. 2.

Fig. 4 is an elevational view of the right hand wiper, as viewed in Fig. 3, looking in the direction of line 4—4 on Fig. 5.

Fig. 5 is a sectional view on line 5—5 on Fig. 4.

Fig. 6 is a sectional view on line 6—6 on Fig. 4.

Fig. 7 is an elevational view of the left hand wiper, as viewed in Fig. 3, looking in the direction of line 7—7 on Fig. 8.

Fig. 8 is a sectional view on line 8—8 on Fig. 7.

Fig. 9 is a sectional view on line 9—9 on Fig. 7.

The apparatus shown in Figs. 1 and 2 includes a number of rolls R1 to R8, which are arranged in a circle about a center post 10. The post 10 is carried by a suitable support 12 and carries at its free end an end plate 14. The rolls have their ends journalled in end plate 14 and in an opposite end plate 16. Plate 14 is rotatable relative to end plate 16 so as to skew the axes of the rolls relative to the axis of the post 10 to produce a thread storing and advancing device. The plate 14 is locked in position by nut 18 which is backed off to permit rotation of end plate 14 so as to skew, or to adjust the skew, of the axes of the rolls. The rolls are provided with pinions, not shown, which engage a ring, or planetary gear, also not shown, which is driven by motor M to rotate the rolls about their respective axes. By this arrangement of the rolls, a thread advancing reel is produced such that, when a filament is wound about the feed end of the reel, the filament will move, in the form of a helix encompassing all of the rolls, from the right hand end of the reel, as viewed in Fig. 1, to the left hand or delivery end of the reel as viewed in this figure. The reel also includes a guide wheel 20 and a godet wheel 22 which are driven by motor M and over which the nascent filament 24 travels on its way to the reel. In order to complete its regeneration, the filament is subjected to treatment by various well known conventionally used liquids such as sulphuric acid, hot

water, soap, sodium carbonate, etc., these liquids being supplied, in the desired order, by nozzles N–1 to N–6 which are mounted above roll R2. After being treated with these liquids, the filament is dried and wound on a spool or the like 26. The structure thus far described forms no part of the invention and is being set forth only to provide the necessary background.

In order to insure an adequate supply, the treating liquids are supplied in large quantities and it is desirable to collect the excess liquids, in the highest possible concentration, for reclamation or re-use. To this end, I previously devised the scrapers disclosed in my aforesaid patent. The scraper referred to works very well but extensive experience with it showed that the structure could be improved in various particulars, all as hereinafter set forth.

As will be best seen from Figs. 2 and 3, I use two scrapers which act upon rolls R–1 and R–2, respectively. The scrapers are in the form of arcuate shells A and B and are placed between the rolls with the convex sides of the shells in juxtaposition. On their concave sides, the scrapers are provided with wiping elements which are adapted to contact the exposed portions of the adjacent rolls so as to remove some of the excess liquids flowing over said rolls.

As will be seen from Figs. 4 to 6, shell A is provided with a wiping element which includes a number of regular V-formations 28 and a number of inverted V-formations 30 with the apices 31 of the regular V-formations disposed at, or below, the bottom edge 32 of shell A and with the apices 33 of the inverted V-formations preferably flush with the upper edge 34 of the shell. This is clearly shown in Fig. 4. Since shell A is associated with roll R2 which turns in the direction of the arrow in Fig. 3, drain openings 36 are provided at the bases of the regular V-formations 28 to prevent accumulation of liquids between the legs of the V-formations.

As will be seen from Figs. 7 to 9, shell B is provided with inverted V-formations 38 which are spaced by flat sections 40. The sides S of inverted V-formations 38 form regular V-formations the bases of which are truncated by flat sections 40. It will be noted that the apices of the inverted V-formations 38 are substantially flush with the upper edge 42 of shell B and that the limbs of the inverted V-formations extend below the bottom edge 44 of the shell. The juxtaposed limbs of adjacent inverted V-formations 38 coact to form intermediate small inverted V-formations 46. Because of the direction of rotation of roll R–1 there is no need for a drain opening in shell B.

In both cases, the scraping elements can be made integral with the respective shells or they can be made separate and secured in position by pins 48. The pins 48 should be of the same material as the wiping elements or should be of some other material which has the same coefficient of wear so that the surfaces of the scraping elements which abut the rolls will be smooth at all times.

The treating liquids are applied to successive zones along roll R2. For example, nozzle N–1 may discharge sulphuric acid over the area there-below; nozzle N–2 may discharge wash water; nozzle N–3 may discharge sodium carbonate and so on, and it is desirable to minimize, as much as possible, the intermingling of the various liquids. The apices 33 of the inverted V wiping elements on shell A and the upper apices 52 of inverted V wiping elements of shell B provide knife edge separation between adjacent zones, as clearly shown in Figs. 4 and 7, so as to minimize intermingling of the liquids to said zones. Also the lower pointed edges 54 and 56 of the wiping elements on shells A and B accelerate the falling off of the liquids. As is well known, a drop of water which will adhere to a flat or to a round surface will not adhere to, and

will readily drop from, a sharp or pointed surface. Thus, the upper apices 33 and 52 effect a sharp separation of the liquids on contiguous zones on the rolls and the lower apices 54 and 56 accelerate the flow, or dropping off, of the liquids. By extending the apices 54 and 56 below the edges of the shells, the liquids scraped by the sides S of the wiping elements will be guided directly into corresponding compartments C formed in a trough T located below the scrapers. From trough T the various liquids are conducted by any suitable means, not shown, to points of reclamation or disposal.

Other points to be noted are (1) the inclined sides S of the wiping element present a longer working surface than is presented by the corresponding vertical elements of my aforesaid prior patent; and (2) these inclined surfaces have a more efficient wiping action than the corresponding vertical edges of the wiping elements in my aforesaid patent.

The bottom edges of shells A and B are preferably extended so as to form triangular portions which serve as backing for the apices 54 and 56. In other words, the bottom edges of the shell have the same configuration as the scrapers.

The shells A and B may be mounted in position in the manner illustrated in my aforesaid patent. As shown in the present case, I mount an open-sided housing 58 on the end plates 14 and 16, or on the supporting frame work, and I place an expandable tube 60 in said housing. When the tube is inflated, its sides bulge out through the open sides of the housing and apply a following pressure against the convex sides of the scrapers as clearly shown in Fig. 3. The shells A and B are provided with lugs 62 and 64 which engage the top of the housing. Because of the direction of rotation of roll R–2, no fastening means is needed to secure lug 62 to the housing. By the same token, the direction of rotation of roll R1 makes it necessary to use screw 66, or the like, to fasten lug 64 to the top of the housing. By this arrangement, the shells are urged against the rolls with a following pressure which is easy to control and by merely deflating tube 60 and disengaging fastening means 66, shells A and B can be pulled outwardly and upwardly, as viewed in Fig. 3, until they wholly clear the rolls.

What I claim is:

1. For use in connection with an elongated rotary roll and means for applying different liquids to different, longitudinally spaced zones on said roll, means for removing some of said respective liquids from said roll and for minimizing intermingling of said liquids, said means including an elongated, horizontally disposed, shell which is arcuate in transverse section, a scraping element carried by, and projecting from the concave side of said shell, and means for mounting said shell in a manner to bring said scraping element into contact with said roll, said scraping element consisting of alternating V, and inverted V, shaped formations, with the lines bisecting the angles of said formations disposed transversely of said shell.

2. The structure recited in claim 1 in which the apices of said inverted V-shaped formations are formed by the junctions of the ends of the limbs of adjacent V-shaped formations.

3. The structure recited in claim 1, there being drain openings formed in said shell near the bottom edge thereof.

4. The structure recited in claim 1 in which the apices of the inverted V-shaped formations substantially coincide with the upper edge of said shell and with the apices of the V-shaped formations below the lower edge of said shell.

5. For use in connection with an elongated rotary roll and means for applying different liquids to different, longitudinally spaced zones on said roll, means for removing some of said respective liquids from said roll and for minimizing intermingling of said liquids, said means including an elongated, horizontally disposed, shell which is arcuate in transverse section, a scraping element carried by, and projecting from the concave side of said shell and means for mounting said shell in a manner to bring said scraping element into contact with said roll said scraping element consisting of alternating V, and inverted V, shaped formations, with the lines bisecting the angles of said formations disposed transversely of said shell, and horizontal sections connecting the lower ends of the limbs of the inverted V-shaped formations and truncating the apices of the V-shaped formations, said sections having upper horizontal straight edges for scraping corresponding areas on said roll.

6. The structure recited in claim 5 in which the bottom edges of said horizontal sections are cut out to form spaced inverted V-shaped formations which extend downwardly from the lower edge of said shell.

References Cited in the file of this patent

UNITED STATES PATENTS

2,625,811	Kuljian	Jan. 20, 1953
2,634,449	Kuljian	Apr. 14, 1953