June 18, 1957 M. J. SMITH 2,796,169

REEL FOR DYE BECK MACHINES

Filed April 18, 1955

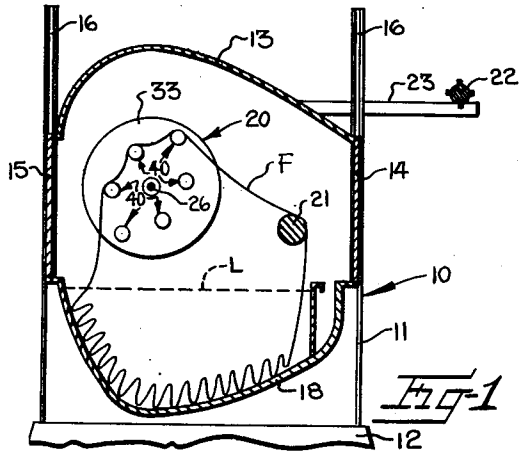


Fig-1

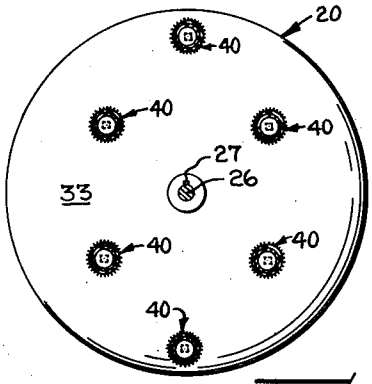


Fig-3

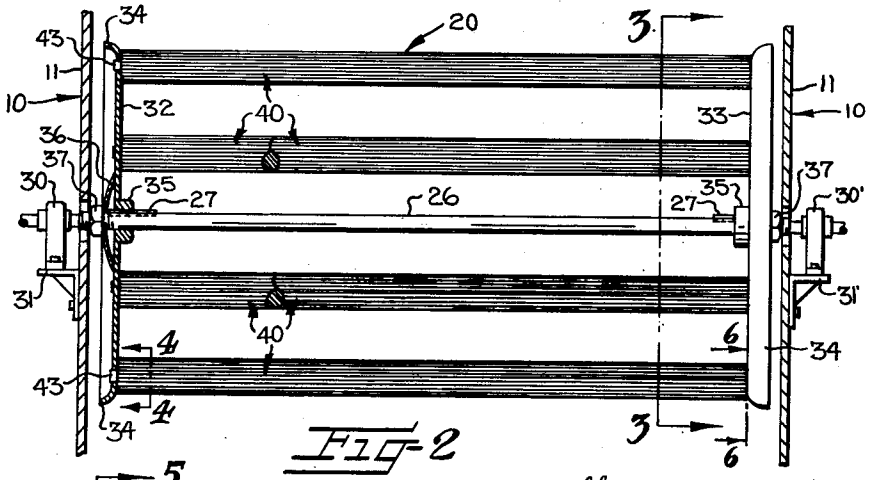


Fig-2

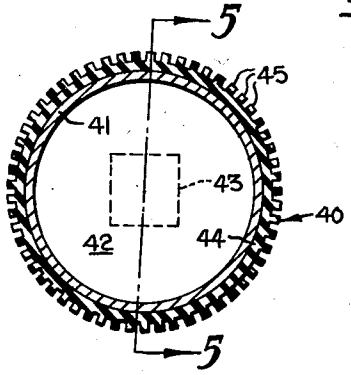


Fig-4

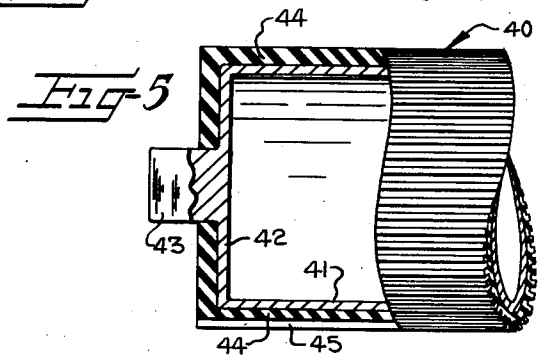


Fig-5

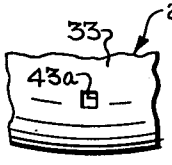


Fig-6

INVENTOR:
MILES J. SMITH

BY Eaton & Bell

ATTORNEYS

United States Patent Office 2,796,169 Patented June 18, 1957

2,796,169

REEL FOR DYE BECK MACHINES

Miles J. Smith, Salisbury, N. C., assignor to Carolina Rubber Hose Company, Salisbury, N. C., a corporation of North Carolina

Application April 18, 1955, Serial No. 501,828

4 Claims. (Cl. 203—355)

This invention relates to dye beck machines and more particularly to an improved reel for such machines.

Dye beck reels have heretofore been equipped with a plurality of spaced parallel metallic bars extending between opposed heads of the reel and about which ropes of fabric are looped whereby the fabric can be passed through the dye liquor. These metallic bars have sometimes been formed in the configuration of elongated cylindrical rods and this has proved disadvantageous in that the cloth has a tendency to slip on the smooth cylindrical rods, thereby permitting the reels to rotate relative to the cloth.

Attempts have been made to overcome this difficulty by forming the metallic bars in the configuration of elongated L-shaped members, such as angle irons, but this has proved disadvantageous in that the cloth is subject to bruising and chafing in passing over the sharp corners of the L-shaped metallic bars. Such bruising and damaging of the cloth can be eliminated by first wrapping the L-shaped bars with cloth other than the fabric which is to be dyed in the dye beck machine. However, this has also proven disadvantageous in that upon changing the liquor in the dye beck machine, the cloth with which the individual metallic bars are wrapped has to be changed also to prevent a foreign color from being imparted to fabric being treated.

It is an object of this invention to overcome this and other disadvantages heretofore encountered in the use of metallic bars in dye beck reels by providing an improved dye beck reel which may be easily cleaned and which will not permit slippage of the ropes of fabric nor will it bruise or otherwise damage the fabric as it is passed thereover during the dyeing process.

It is more specifically an object of this invention to provide a reel for dye beck machines comprising opposed heads connected by a plurality of elongated cylindrical members, each of which is provided with a covering having a flexible irregular surface for engaging the fabric as it passes over the reel to prevent rotation of the reel relative to the fabric and at the same time to insure that the cloth will not be damaged.

It is another object of this invention to provide a dye beck reel comprising a plurality of fluted rubber covered rolls extending between opposed heads of the reel wherein means are provided for normally preventing rotational movement between the rolls and the heads, said means also permitting the individual rolls to be rotated one-quarter revolution relative to the heads to present a new roll surface to engage the fabric upon a previously exposed roll surface becoming worn. Means are also provided whereby the rolls may be readily removed from the heads when desired.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a somewhat schematic transverse sectional

view of a dye beck machine showing the improved reel therein;

Figure 2 is a front elevation of the improved reel with parts in section and parts broken away and showing a portion of the dye beck machine in section;

Figure 3 is a verticel sectional view taken along the line 3—3 in Figure 2;

Figure 4 is an enlarged sectional view of one of the rolls in the improved reel;

Figure 5 is a vertical sectional view taken along the line 5—5 in Figure 4;

Figure 6 is an enlarged fragmentary view of the lower portion of Figure 3, omitting the rolls.

Referring more specifically to the drawings, the numeral **10** broadly indicates a dye beck machine having a housing **11** supported on a base **12**, which housing **11** may include a housing top **13** and front and rear vertically sliding doors **14** and **15**, respectively, mounted in vertical guides **16**. A tub or receptacle **18** is disposed within the housing **11** for the reception of dye liquor L and a reel **20** and a front roll **21** are suitably journalled in the sides of housing **11** above the tub **18**. A doffer roll **22** is suitably journalled in a pair of forwardly extending arms **23**, only one of which is shown.

The reel **20** is keyed on a shaft **26** as at **27**, and opposite ends of the shaft **26** preferably extend through corresponding sides of the housing **11** and are suitably journalled in bearings **30** and **30'** mounted on respective brackets **31** and **31'** secured to the housing **11**. Means, not shown, are provided for imparting rotation to the shaft **26** relative to the housing **11**.

The foregoing structure is illustrative only and merely serves to identify an environmental embodiment with which my invention may be associated, it being understood that the invention may be readily associated with various types of fabric treating machines without departing from the spirit of the invention.

The improved reel **20** comprises a pair of spaced cylindrical heads **32** and **33** which are preferably formed from stainless steel and provided with outwardly extending annular flanges **34** for reinforcing and obtaining rigid head **32** and **33**. The central portion of each of the head **32** and **33** is provided with a hub **35** keyed on the shaft **26** and a bearing plate **36** is secured to the outer surface of each of the heads **32** and **33** opposite the hub **35**. The bearing plates **36** are also penetrated by the shaft **26** and each serves as a bearing surface for nuts **37** threaded on the shaft **26** to normally prevent endwise movement of the heads **32, 33** relative to the shaft **26**.

A plurality of spaced rolls **40** extend between the heads **32** and **33** and although there are six such rolls indicated in Figures 1, 2 and 3, it is to be understood that any desired number of rolls may be used. The rolls **40** are preferably arranged in an elliptical pattern between the heads **32, 33**, and each of the rolls **40** comprises a hollow steel cylinder **41** closed at both ends by end walls **42** from the outer surface of which project axially extending rectangular hubs or lugs **43**. The lugs **43** extend through correspondingly shaped openings **43a** (Figure 6) in the heads **32** and **33** as seen in the lefthand side of Figure 2 thereby normally fixing the rolls **40** against rotational movement relative to the heads **32** and **33**.

The rolls **40** also include a non-absorbent resilient or rubber covering **44** suitably bonded to the outer surface of the metal cylinder **41** and extending about the outer surface of the end walls **42** in abutting engagement with the rectangular lugs **43**.

The outer surface of the resilient or rubber covering **44** is fluted. The fluted surface is formed by spaced axially extending projections **45**, which preferably ex-

tend the entire length of the rolls 40. The projections 45 do not extend radially adjacent the end walls 42, that portion of the rubber covering 44 being preferably provided with a smooth outer surface.

The spacing of the projections 45 may vary in accordance with the diameter of the roll 40, but it is preferable that the projections 45 be spaced a sufficient distance and be of such a width as to permit the same to flex or bend under the weight of fabric F carried by the reel 20.

The bending of the projections 45 under the weight of the fabric F increases the frictional contact between the rolls 40 and the fabric F and at the same time presents a sharp yieldable surface which digs into the fabric and has been found to greatly reduce slippage of the fabric on the reel 20 without bruising or chafing the fabric. This is an important feature of the invention since it permits large quantities of fabric to be uniformly dyed.

It will be noted that the head 32 is preferably spaced inwardly from the housing 11 a sufficient distance to permit the corresponding nut 37 to be loosened whereby the head 32 may be moved to the left in Figure 2 to disengage the head 32 from the lugs 43 on the rolls 40. In this manner, the rolls 40 may be periodically rotated a quarter of a turn relative to the heads 32 and 33 to present a new wearing surface to the fabric upon a previously exposed wearing surface becoming worn. The rolls 40 may also be completely replaced, if desired, in a similar manner.

It is to be understood that the projections 45 may be arranged in sinuous paths instead of in straight paths as shown in the drawings. Also, if desired, the projections 45 may be divided into sections longitudinally thereof.

It should be noted that a hard rubber core may be used in lieu of the metallic cylinder 41 if desired, but in any event, it is apparent, that the rolls 40 may be easily cleaned when it is desired to change the dye liquor in the tub or receptacle 18. The overlapping end portions of the resilient or rubber covering 44 which tightly abut against the lugs 43 permit the rolls to be easily cleaned when it is desired to change the dye liquor in the tub 18.

It is thus seen that there is provided an improved reel for dye beck machines which greatly facilitates the handling of fabric within the machine.

In the drawings and specifications there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a dye beck machine having a housing and a transverse shaft rotatably mounted relative to said housing, a reel comprising a pair of spaced heads mounted on said shaft, means for preventing relative rotational movement between said heads and said shaft, adjustable means for limiting endwise movement of said heads relative to said shaft, a plurality of fluted resiliently covered rolls extending between said heads, a squared lug extending axially from each end of each of said rolls, each of said heads having a group of squared openings therein adapted to register with the squared lugs on said rolls whereby rotational movement of said rolls relative to said head is prevented upon said adjustable means being tightened and whereby said rolls may be readily removed from said heads upon said adjusting means being loosened.

2. In a dye beck machine having a housing and a transverse shaft rotatably mounted relative to said housing, a reel comprising a pair of spaced heads mounted on said shaft, means for preventing relative rotational movement between said heads and said shaft, adjustable means for limiting endwise movement of said heads relative to said shaft, a plurality of elongated members extending between said heads, an irregular resilient surface on each of said elongated members defining a plurality of spaced flexible projections, rectangular lugs extending axially from each end of each of said members, each of said heads having a group of rectangular openings therein adapted to register with the lugs on said members whereby rotational movement of said members relative to said head is prevented upon said adjustable means being tightened and whereby said members may be readily removed from said heads upon said adjusting means being loosened.

3. In a dye beck machine having a housing and a shaft rotatably mounted relative to said housing, a reel comprising: a pair of spaced heads slidably mounted on said shaft and fixed against rotational movement relative to said shaft, each of said heads having a plurality of squared openings arranged about the axis of the reel, a plurality of elongated members extending between said heads, squared lugs extending axially from the ends of the elongated members and normally penetrating the squared openings in the reel heads, and adjustable means normally confining the reel heads against axial movement relative to the shaft, said means being operable to permit axial movement of at least one of the heads away from the other head whereby all of the elongated members may be removed and reinstalled.

4. A structure according to claim 3 wherein a plurality of spaced flexible projections extend from the periphery of each elongated member.

References Cited in the file of this patent

UNITED STATES PATENTS

164,004	Jones et al.	June 1, 1875
1,836,936	Peterson	Dec. 15, 1931
1,957,618	Simonds	May 8, 1934
2,240,386	Butterworth	Apr. 29, 1941
2,356,026	Berry	Aug. 15, 1944
2,572,276	Moe	Oct. 23, 1951
2,748,587	Schulze	June 5, 1956