Nov. 2, 1948. H. S. DRUM ET AL 2,452,638

PACKAGE EXTRACTOR

Filed Feb. 7, 1945 2 Sheets-Sheet 1

Fig. 1.

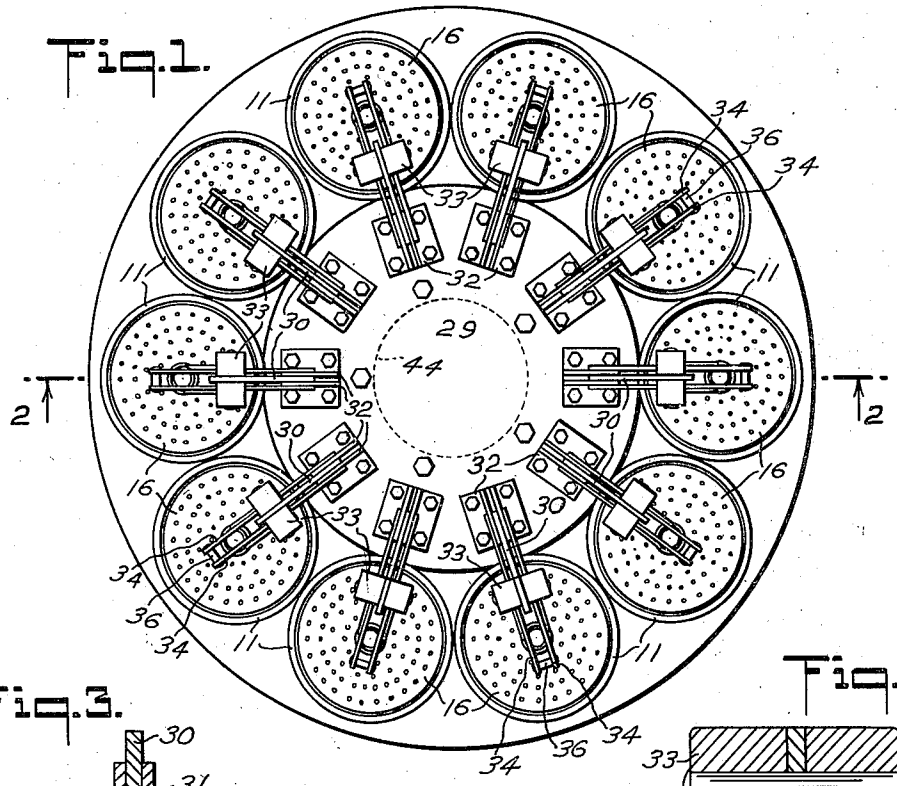
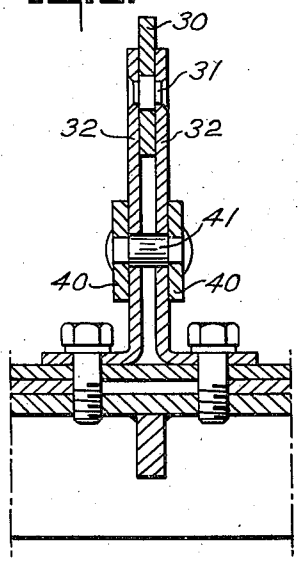



Fig. 3.



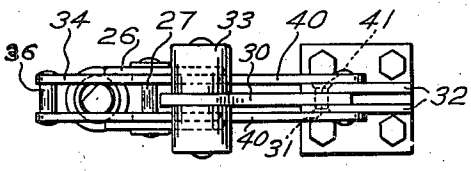




Fig. 6.

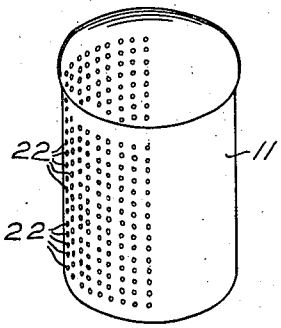
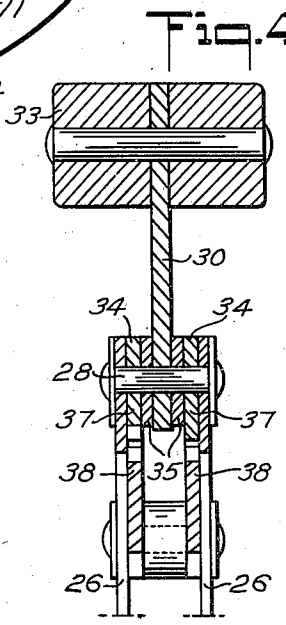



Fig. 5.

Fig. 4.




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PACKAGE EXTRACTOR

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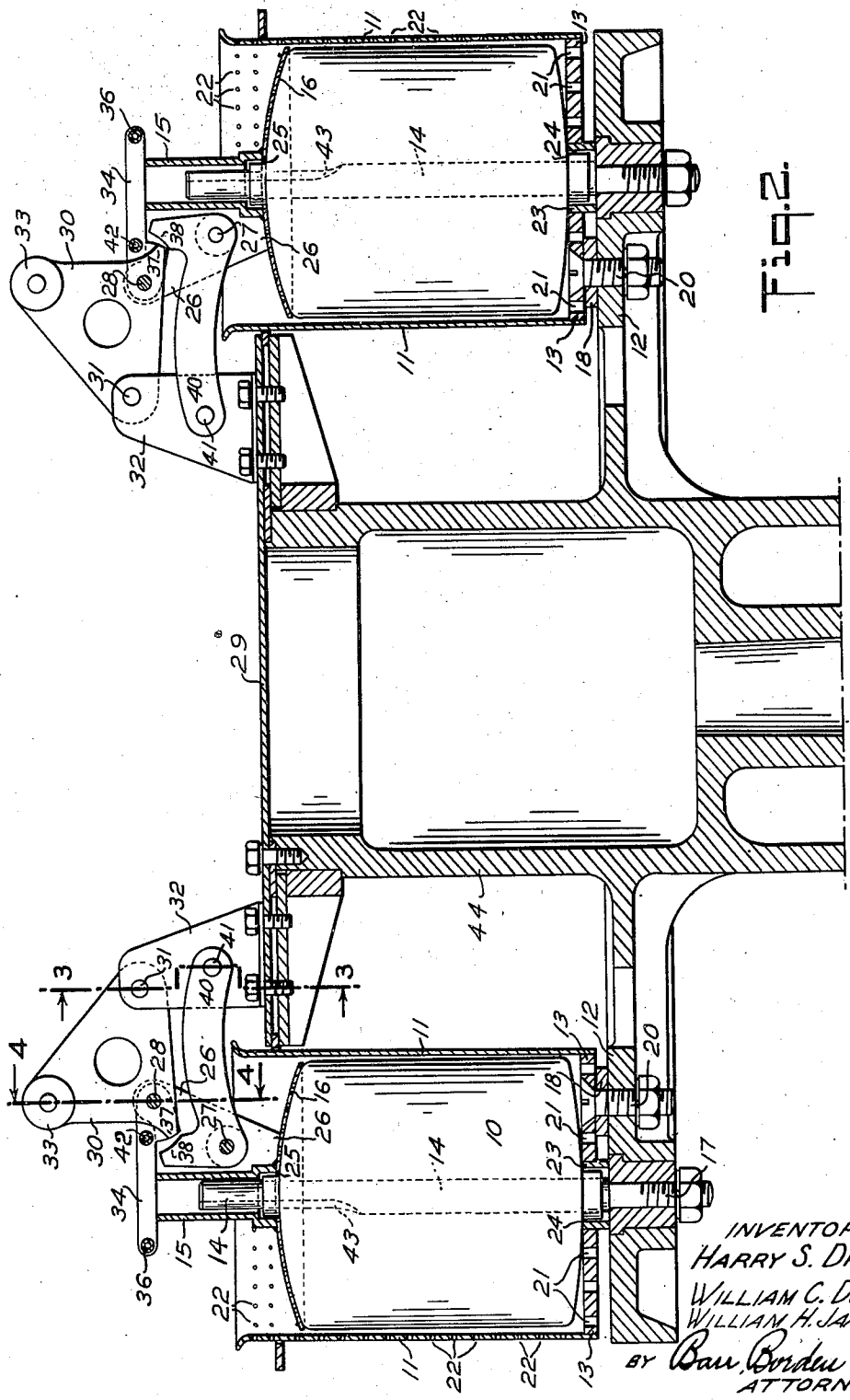


Fig. 2.

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## PACKAGE EXTRACTOR

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The present invention relates to extractors and more particularly to a centrifugal extractor for packages of yarn.

During the operation of dyeing yarn packages of the type where the yarn is wound upon a mandrel tube, the packages become so distorted as to cause the ends of the package to bulge to such an extent that the yarn goes over the end of the mandrel tube. When packages so bulged are mounted on a creel for winding into warp or other form, the exposed end yarn becomes chafed and damaged.

Some of the objects of the present invention are: to provide an improved extractor for packages of yarn; to provide an apparatus for extracting liquid simultaneously from a number of packages of yarn; to provide a centrifugal extractor for yarn packages wherein provision is made for reshaping such packages as have bulged or deformed during the dyeing operation; to provide means for maintaining a pressure transverse to the applied centrifugal force in an extractor so that the ends of the packages are flattened; and to provide other improvements as will hereinafter appear.

In the accompanying drawings, Fig. 1 represents a plan of a yarn package extractor embodying one form of the present invention; Fig. 2 represents, on an enlarged scale, a section on line 2—2 of Fig. 1; Fig. 3 represents a section on line 3—3 of Fig. 2; Fig. 4 represents a section on line 4—4 of Fig. 2; Fig. 5 represents a perspective of one of the yarn package receptacles, all of which are alike; and Fig. 6 represents a detail in plan of the cover control mechanism.

Referring to the drawings, one form of the present invention is shown wherein yarn packages 10 are respectively contained in receptacles 11, of which, in the present instance, there are ten fixedly mounted upon a rotatable plate 12 and arranged circumferentially about the axis of the plate and, preferably, radially equidistant from such axis. The yarn packages 10 are each of well-known form wound about a tube which is generally of the perforated type. Since all of the receptacles 11 and associated parts are alike, the present description will be limited to one receptacle and its novel parts, since this is sufficient for a complete understanding of the invention.

A receptacle 11 therefore comprises a cylindrical open top member rising from a bottom 13 through which an axially disposed package supporting spindle 14 rises to a height sufficient to pass through the package tube and project as a guide for the tubular stem 15 of a perforated cover 16. The spindle 14 is bolted as shown at 17 to the

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plate 12, while the bottom of the receptacle 10 is spaced from the plate 12 by a spacer 18 and anchored by a stud 20. This spacing allows the receptacle 10 to drain through holes 21 provided in the bottom 13. That arcuate portion of the receptacle 10 on the opposite side of the spindle 14 from the axis of rotation of the plate 12 is provided with perforations 22 covering the area juxtaposed to the adjacent side of a package in the receptacle. It should be noted that an annular bushing 23 is located in the hole in the bottom through which the spindle 14 passes in order to provide a clearance 24 of a size to receive the projecting end of the tube upon which the yarn is wound. Also, the tubular stem 15 is of enlarged diameter at its junction with the cover 16 to provide an annular clearance 25 about the spindle 14 to receive the other projecting end of the package tube.

In order to reshape the ends of the yarn package due to bulging during the dyeing operation, the cover 16 is provided and its stem 15 has telescopic relation with the spindle 14, permitting free relative sliding movement of the cover 16 under pressure applied to the projecting end of the stem 15 during the extracting operation.

In order to create this package reshaping pressure and also to prevent the cover from rising due to upward pressure of possible yarn expansion before the machine comes up to its extracting speed, two wing-like offset extensions 26 are welded or otherwise made fast in spaced relation to the side of the stem 15, and also preferably to the cover 16 to provide a support for two pivots 27 and 28. The pivot 28 transmits the motion of a centrifugally actuated arm 30 to the cover 16 to cause the latter to bear upon the end of a package to reshape any end malformation resulting from the dyeing operation. The arm 30 is pivoted at 31 between two upstanding angle plates 32, bolted or otherwise fastened to the rotatable table top 29, and receives its motion from a weight 33 fixed to the arm 30 in such spaced relation from the pivot 31 as to cause the cover 16 to move downwardly under outward swing of the weight due to centrifugal action.

In order to prevent upward movement of the cover 16 due to pressure developed internally of the receptacle 11, two latch levers 34 are pivoted upon the pivot 28 being spaced apart to straddle the arm 30 with suitable spacing washers 35 interposed as shown. The free ends of the levers 34 are interconnected by a hand grip 36 for movement together. Each lever 34 is provided with an arcuate faced stop 37 arranged in the path

of a complemental faced short arm 38 of a latch bell crank 40. The two bell cranks 40 are pivoted upon the pivot 27, with the long arm thereof pivoted upon a pivot 41 passing through the plates 32. Thus, the two latch bell cranks straddle the two plates 32 at one end and at the other end lie between the two wing extensions 26, the arrangement being such that the respective short arms 38 are respectively in the plane of the two stops 37. Thus, when the cover 16 is lowered into contact with the top of a yarn package, the dual latch lever 34 is swung to a position parallel to the top of the stem 15 and is so located by means of a pin 42 transversely disposed between the two parts of the lever 34 and which meets the top of the wing extensions 26 as a limit. When so positioned, any upward thrust of the cover 16 is transmitted to the latch bell cranks 40 which are now in abutting relation to the stops 37 and lock the parts against movement.

The plate or disc 12 upon which the receptacles 11 are mounted is part of a central hub 44 which also supports the upper table 29, to which the latch and centrifugal assembly is mounted. Also, the table 29 is apertured circumferentially to snugly fit about the upper end portions of the respective receptacles. The hub 44 forms an extension of the main driven shaft (not shown) of the machine and receives motion from a suitable source of power.

In order to facilitate the removal of the packages from the respective spindles 14, each spindle is provided with a flat or groove 43 at its upper end which serves to permit the insertion of a wire or the like which can be hooked into a perforation of the package tube and thus allow the package to be lifted out.

In operation, one yarn package 10 is placed in each of the receptacles 11 and then the covers 16 are respectively placed over the packages with each spindle end within the tubular stem 15 of the cover. The several latch levers 34 are now brought forward and down to engage the end of the stems 15 in order to prevent the packages from shifting upward when the machine is started and thereafter to exert a downward pressure upon the covers 16 caused by the weights 33 swinging outward under centrifugal force. Since the weights 33 are above the respective pivots 31, this swinging action will be translated into a linear motion pressing the covers 16 against the packages with the desired squeezing action which restores any bulges or irregularities and results in flattening both ends of the packages while allowing the yarn mandrels to project a short distance from each end. This linear or straight line motion is made possible by the length of the bell cranks 40 and the location of the connections of the bell cranks 40 with respect to the pivots 27.

Having thus described our invention, we claim:

1. An extractor for yarn packages wound on tubes comprising a rotatable plate, a plurality of individual yarn package receptacles having perforations in the side thereof, means to attach each receptacle to said plate and spindles adapted to telescopically receive the respective tubes of said packages, said spindles respectively rising axially from the bottoms of said receptacles for telescopic mounting of said yarn packages respectively.

2. An extractor for yarn packages wound on tubes comprising a rotatable plate, a plurality of individual yarn package receptacles having perforations in the side thereof, means to attach each receptacle to said plate, spindles adapted to telescopically receive the respective tubes of said packages, said spindles respectively rising axially from the bottoms of said receptacles for telescopic mounting of said yarn packages respectively, and covers respectively slidable on said spindles for engaging the top of said packages.

3. An extractor for yarn packages wound on tubes comprising a rotatable plate, a plurality of individual yarn package receptacles having perforations in the side thereof, means to attach each receptacle to said plate, spindles adapted to telescopically receive the respective tubes of said packages, said spindles respectively rising axially from the bottoms of said receptacles for telescopic mounting of yarn packages respectively, and individual means for respectively exerting downward pressure upon said packages.

4. An extractor for yarn packages wound on tubes comprising a rotatable plate, a plurality of individual yarn package receptacles having perforations in the side thereof, means to attach each receptacle to said plate, spindles adapted to telescopically receive the respective tubes of said packages, said spindles respectively rising axially from the bottoms of said receptacles for telescopic mounting of said yarn packages respectively, and individual centrifugal means carried by said rotatable plate for respectively exerting downward pressure upon said packages.

5. An extractor for yarn packages wound on tubes comprising a rotatable member, a receptacle for a yarn package attached to said member, and having perforations in the side thereof, a cover, means to mount said cover for movement in said receptacle to compress a yarn package in said cover, means attached to said rotatable member and including a weight pivoted to move under centrifugal force to cause said cover to compress said package, and means coacting with said compressing means to prevent said cover moving in opposition to said compressing means.

6. An extractor for yarn packages wound on tubes comprising a rotatable member, a receptacle for a yarn package attached to said member and having perforations in the side thereof, said receptacle having a bottom provided with an axially disposed opening, a spindle adapted to telescopically receive the tube of a yarn package and having its lower end passing through said opening, means to attach said end to said rotatable member, a cover having an axially disposed opening to receive the upper end of the tube of said package, means to mount said cover for movement in said receptacle to compress the yarn package, and centrifugal means for causing said cover to compress said package.

7. An extractor for yarn packages comprising a rotatable member, a receptacle for a yarn package arranged to move with said member and having perforations in the side thereof, said receptacle having a bottom provided with an axially disposed opening to receive one end of the tube of a yarn package, a cover having an axially disposed opening to receive the other end of the tube of said package, means to mount said cover for movement in said receptacle to compress the yarn package, a pivoted weighted member responsive to centrifugal force, a lever system between said member and said cover to move said cover downward to compress said package under centrifugal force, and latch means associated

with said lever system to prevent movement of said cover due to expansion of said package.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 417,799 | Waldbaur | Dec. 24, 1889 |
| 1,095,028 | Resch | Apr. 28, 1914 |
| 1,473,655 | Sweeley | Nov. 13, 1923 |
| 1,688,555 | Rankin | Oct. 23, 1928 |
| 1,973,953 | Gordon, Jr. | Sept. 18, 1934 |
| 2,224,292 | Dwyer | Dec. 10, 1940 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 668,962 | Germany | Dec. 14, 1938 |