

Aug. 2, 1966

H. L. LUTHER

3,264,027

DOFFING TOOL

Filed Sept. 2, 1964

3 Sheets-Sheet 1

FIG. 1.

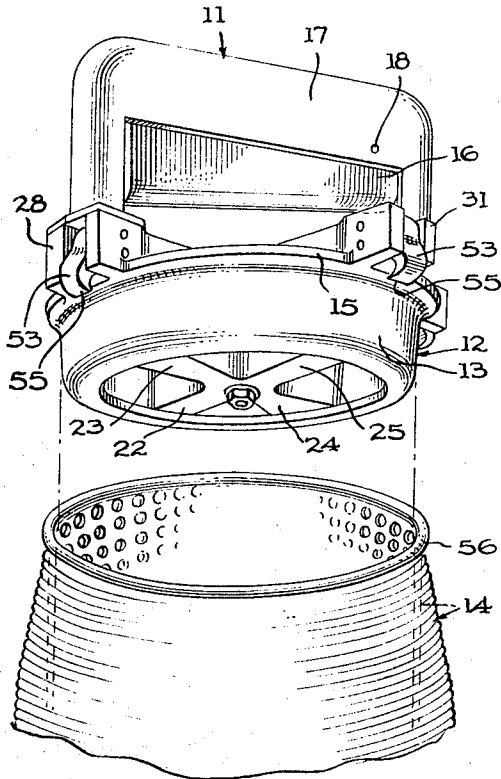


FIG. 2.

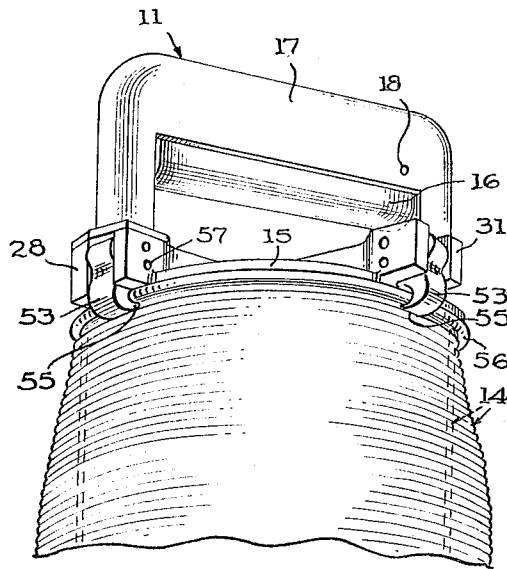


FIG. 3.

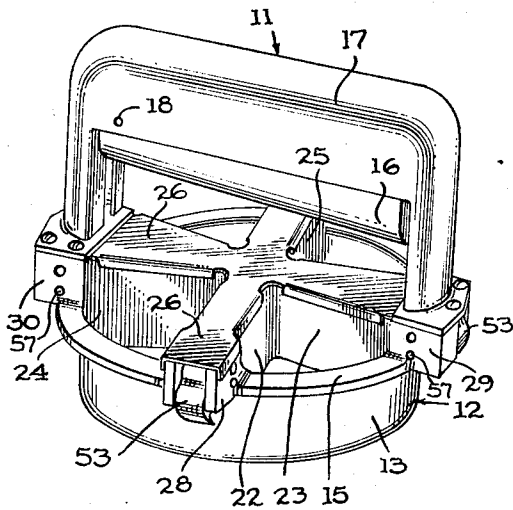
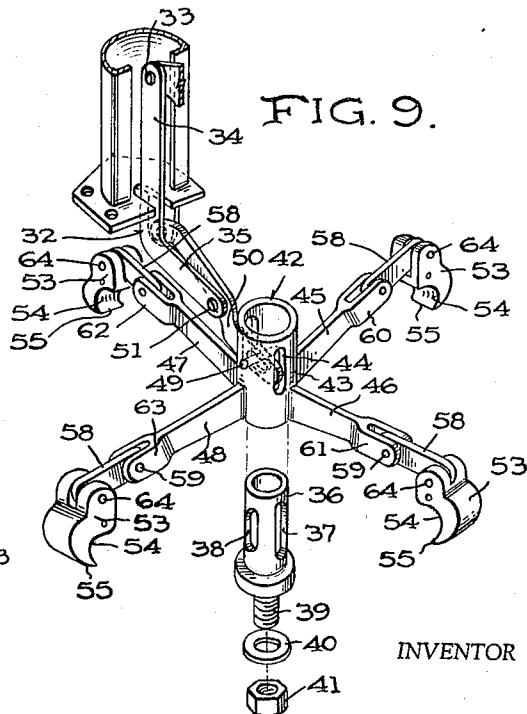


FIG. 9.



INVENTOR

H. L. LUTHER

R. L. Luther
ATTORNEY

BY

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FIG. 4.

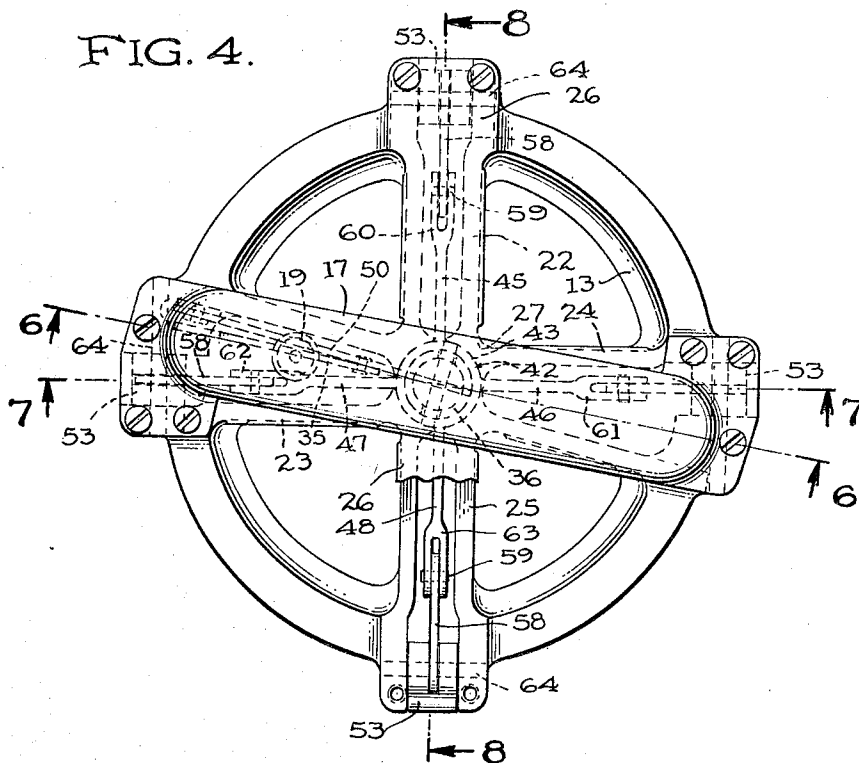
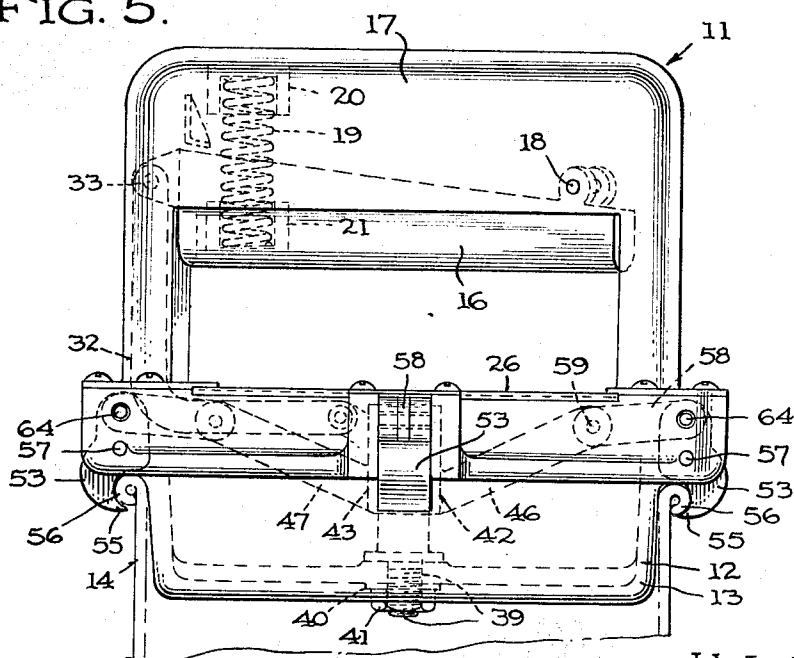


FIG. 5.



INVENTOR

BY

H. L. LUTHER
Rudolph S. Bley
ATTORNEY

Aug. 2, 1966

H. L. LUTHER

3,264,027

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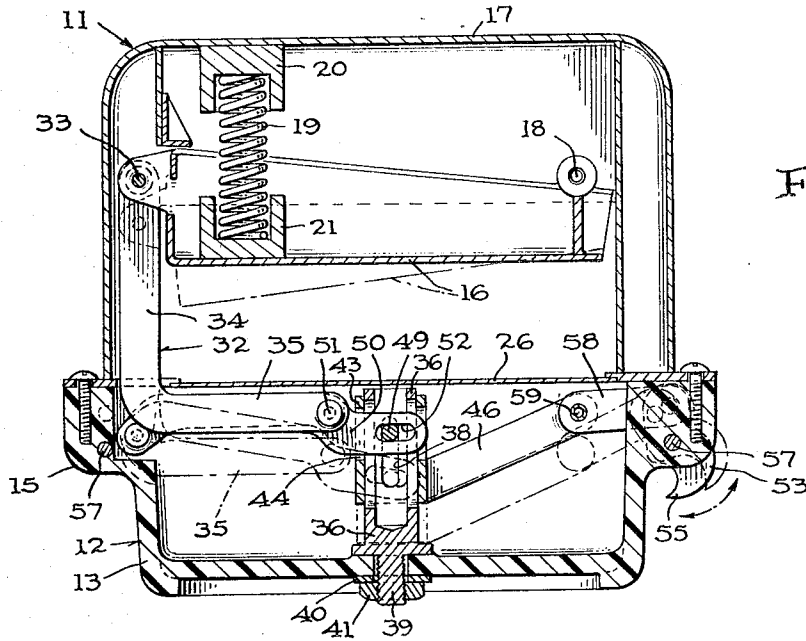


FIG. 6.

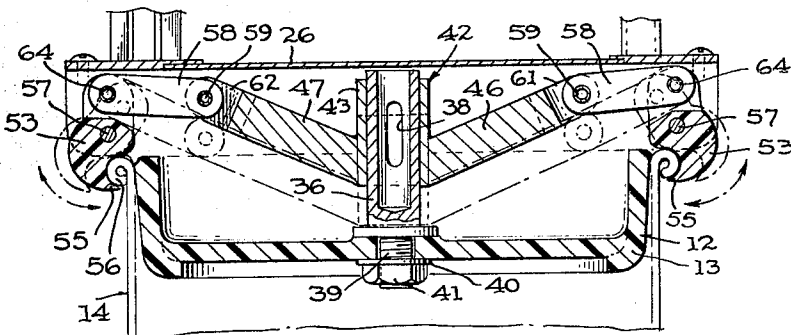


FIG. 7.

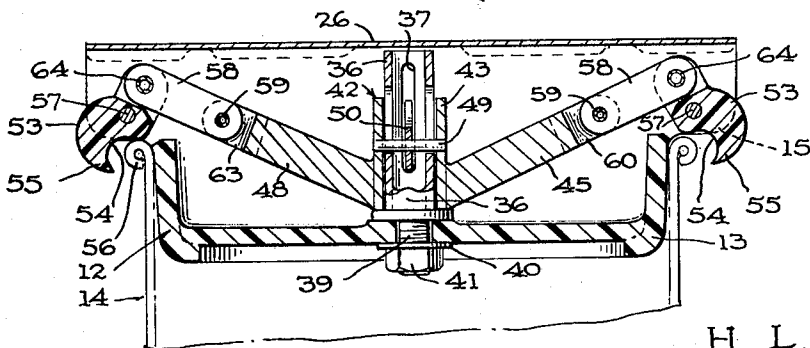


FIG. 8.

INVENTOR

H. L. LUTHER
Rudolph S. Bley

BY

ATTORNEY

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3,264,027

DOFFING TOOL

Herbert L. Luther, Elizabethton, Tenn., assignor to Beannit Corporation, New York, N.Y., a corporation of New York

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4 Claims. (Cl. 294-16)

This invention relates to a tool for handling hollow spools having packages of textile yarn wound thereon. More particularly the invention is concerned with a hand tool for doffing and otherwise handling even relatively large textile yarn packages on hollow spools which are beaded at their ends.

Although the yarn packages produced in textile mills cover practically all of the spool surface it is necessary that the operators handle them without touching the package because even the slightest contact would damage the yarn.

The object of this invention is to provide an improved hand-manipulated doffing tool particularly adapted for handling hollow textile spools beaded at their ends.

A further object is to provide a tool for easily and surely handling even relatively heavy spools of this type.

A still further object is to provide a tool which is simple in design, inexpensive, and which can be handled by an operator with one hand in a facile manner. Further objects and advantages of the invention will be apparent from the drawing and descriptions thereof.

In the drawing FIG. 1 is a perspective view of a preferred form of the doffing tool disposed over a beaded spool which is to be lifted.

FIG. 2 is a view similar to FIG. 1 but showing the tool gripping the spool.

FIG. 3 is a perspective view of the tool.

FIG. 4 is a top plan view of the tool.

FIG. 5 is an elevational view of the tool.

FIG. 6 is a sectional view along line 6-6 of FIG. 4.

FIG. 7 is a sectional view along line 7-7 of FIG. 4.

FIG. 8 is a sectional view along line 8-8 of FIG. 4, but with the tongs in the open or non-gripping position.

FIG. 9 is a perspective view, partially exploded, showing the tongs and the linkage which operates them.

Referring now to the drawings it will be seen that the doffing tool shown has a handle 11, preferably made of sheet metal, secured by screws to a casing 12, preferably made of a light plastic material. The casing has a ring-shaped portion 13 of such diameter that it fits loosely in the end of spool 14 to be lifted and shoulder 15 which rests on the end of the spool to be lifted. Four "U-shaped" members 22, 23, 24 and 25, tapered if necessary to accommodate the linkages to be disposed therein and covered at their tops by plate 26 secured by screws at the free ends, extend inwardly from ring-shaped portion 13, at the points where the handle is attached and approximately 90 degrees therefrom, toward the center of the ring where their open ends join to form an approximately cylindrical chamber 27. The "U-shaped" members have terminal portions 28, 29, 30 and 31, slightly enlarged in width and wall thickness and open at their free ends, extending through and above shoulder 15.

A trigger 16, disposed below and partially within U-shaped grip 17 of handle 11 and generally parallel to the grip, is pivotally mounted on the handle by roll pin 18 and is urged away from the grip by spring 19 which rests in cup 20 secured to the grip and cup 21 secured to the trigger.

"L-shaped" member 32, secured to trigger 16 near its free end by roll pin 33, has a portion 34, which extends away from the grip and at approximately right angles

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to it, and a portion 35 which extends inwardly through "U-shaped" member 23 toward chamber 27.

Hollow guide pin 36, provided with elongated longitudinal openings 37 and 38, is fixed in the center of chamber 27 by means of threaded portion 39, washer 40 and nut 41. Tong holder 42 consists of hollow cylinder 43, provided with elongated longitudinal openings 44, slidably mounted on guide pin 36, and arms 45, 46, 47 and 48, rigidly secured to cylinder 43 and extending outwardly through the "U-shaped" chambers, each arm inclined toward the grip and bifurcated at its free end. Pin 49, secured in hollow cylinder 43, extends across the cylinder, passing through elongated openings 38 in the hollow guide pin.

Trigger bar 50, attached to portion 35 of "L-shaped" member 32 by means of roll pin 51, extends through elongated openings 37 and 44 in guide pin 36 and cylindrical member 43, respectively. Pin 49 passes through elongated opening 52 near the free end of trigger bar 50.

Tongs 53 have inwardly facing surfaces 54, curved so that the hook-like ends 55 can be positioned under bead 56 at the end of spool 14 while the upper portion of the curved surface bears against the bead, as shown in FIG. 2 and FIG. 7. A tong is pivotally mounted on a roll pin 57 in each of the elongated terminal portions 28, 29, 30 and 31 of the "U-shaped" members. A link 58 is pivotally mounted near one end by means of roll pin 59 in each of the bifurcated free ends 60, 61, 62 and 63 of arms 45, 46, 47 and 48 and near the other end by means of roll pin 64 in the bifurcated upper ends of tongs 53.

Rivets or bolts and nuts may be used as pivotal mountings in place of the roll pins. The use of roll pins or bolts and nuts facilitates the replacement of worn or damaged parts.

When the tool is to be used to lift a spool the operator holds the tool by grip 17 and, while applying no pressure on trigger 16, inserts ring-shaped member 13 of the casing into the end of spool 14 until shoulder 15 rests on bead 56, as shown in FIG. 5 and FIG. 8. Pressure is then applied to the trigger to cause it to swing upwardly against spring 19. As the trigger swings upwardly "L-shaped" member 32 moves upwardly and, acting through trigger bar 50 and cross pin 49, causes cylindrical member 43 and the attached arms to slide upwardly on guide pin 36. As cylindrical member 43 moves upwardly arms 45, 46, 47 and 48, acting through links 58, cause tongs 53 to pivot on pins 57 so that the lower ends 55 are positioned under bead 56 at the end of the spool, as shown in FIG. 7. As long as pressure is applied to the trigger the tool holds the spool firmly. As soon as the pressure on the trigger is released spring 19 causes the trigger, the "L-shaped" member and the cylindrical member with its attached arms to return to their former positions so that the tongs release the bead of the spool, all as shown in dotted line in FIG. 6 and FIG. 7 and in FIG. 8.

The preferred embodiment of the invention described has four tongs but it is to be understood that the tool may have as few as three tongs, or as many more as may be desired. Other changes or variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A doffing tool for spools having beaded ends comprising a handle having a grip portion, a circular casing attached to said handle, said casing having an outwardly extending shoulder, at least three tongs pivotally mounted on said shoulder, each of said tongs having an inwardly facing curved portion terminating in a hook-like portion, a linkage comprising a trigger pivotally mounted below said grip, a tong holder slidably mounted on a guide disposed within said casing, said tong holder having arms

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rigidly secured thereto and extending outwardly toward each of said tongs, a link connecting said trigger and said tong holder, and a link connecting each of said tong holder arms and said pivotally mounted tongs, and a spring member urging said linkage to a desired position.

2. A doffing tool for spools having beaded ends comprising a handle having a grip portion, a circular casing attached to said handle, said casing having an outwardly extending shoulder, at least three tongs pivotally mounted on said shoulder, each of said tongs having an inwardly facing curved portion terminating in a hook-like portion, a linkage comprising a trigger pivotally mounted near one end below said grip, a tong holder slidably mounted on a guide disposed within said casing, said tong holder having arms rigidly secured thereto and extending outwardly toward each of said tongs, an L-shaped link connecting the free end of said trigger and said tong holder, and a link connecting each of said tong holder arms and said tongs, and a spring disposed between said grip and said trigger.

3. A doffing tool for spools having beaded ends comprising a handle having a grip portion, a circular casing attached to said handle, said casing having an outwardly extending shoulder, at least three tongs pivotally mounted on said shoulder, each of said tongs having an inwardly facing curved portion terminating in a hook-like portion, a linkage comprising a trigger pivotally mounted near one end below said grip, a tong holder comprising a cylindrical member slidably mounted on a hollow cylindrical guide member disposed within said casing, each of said cylindrical members having pairs of oppositely disposed elongated longitudinal openings, a pin extending across said slidably mounted member, and passing through a pair of elongated openings in said guide, and arms rigidly secured to said slidable member and extending outwardly toward each of said tongs, an L-shaped link secured to the free end of said trigger, said L-shaped link having a portion extending away from said grip at approximately right angles thereto and a portion extending inwardly toward said cylindrical portion of said tong holder, a link connecting said L-shaped member and said pin of said slidably mounted member of said tong holder, said link passing through elongated openings in said cylindrical members, and a link connecting each of said

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tong holder arms and said tongs, and a spring disposed between said trigger and said grip.

4. A doffing tool for spools having beaded ends comprising a handle having a grip portion, a circular casing attached to said handle, said casing having a ring-shaped portion, a shoulder extending outwardly therefrom and at least three U-shaped members extending inwardly from said shoulder and said ring-shaped member toward the center thereof where said members meet to form a substantially cylindrical chamber, a tong pivotally mounted in the open end of each of said U-shaped members above said shoulder, said tongs having inwardly facing curved portions terminating in hook-like portions, a linkage comprising a trigger pivotally mounted near one end below said grip, a tong holder comprising a cylindrical member slidably mounted on a hollow cylindrical guide member disposed within said substantially cylindrical chamber, each of said cylindrical members having pairs of oppositely disposed elongated longitudinal openings, a pin extending across said slidably mounted member and passing through a pair of elongated openings in said guide, and arms rigidly secured to said slidable member and extending outwardly through each of said U-shaped chambers toward said tongs, an L-shaped link secured to the free end of said trigger, said L-shaped link having a portion extending away from said grip at approximately right angles thereto and a portion extending inwardly through one of said U-shaped chambers toward said cylindrical portion of said tong holder, a link connecting said L-shaped member and said pin of said slidable member, said link passing through elongated openings in said cylindrical members, and a link pivotally secured each of said tong holder arms and said tongs, and a spring disposed between said trigger and said grip.

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GERALD M. FORLENZA, *Primary Examiner.*

G. F. ABRAHAM, *Assistant Examiner.*