Feb. 15, 1966 J. F. VOSBURG 3,234,694

ABRASIVE STRIP HOLDING AND TIGHTENING MECHANISM

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FIG. 1.

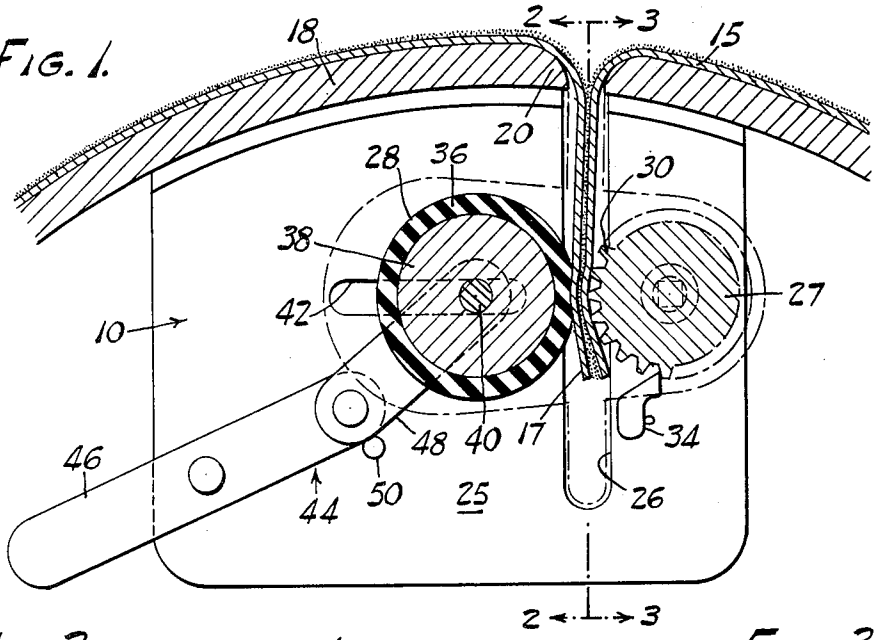


FIG. 2.

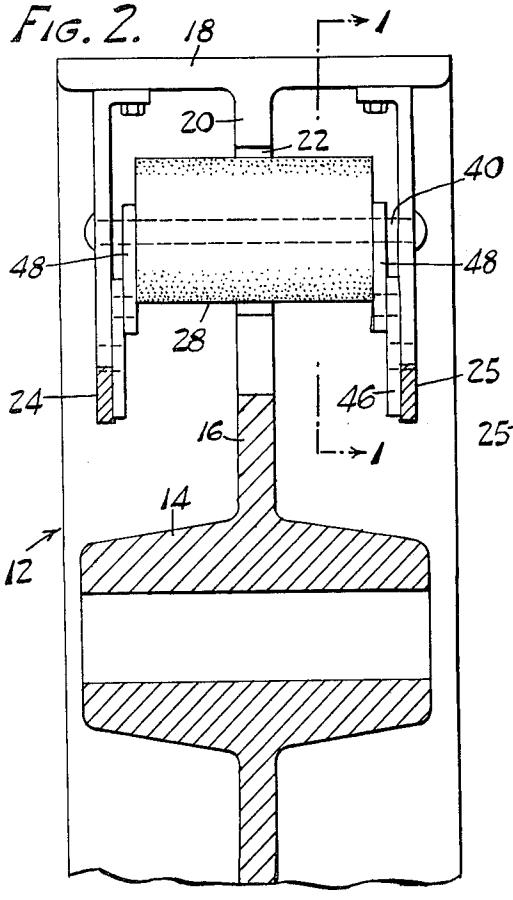
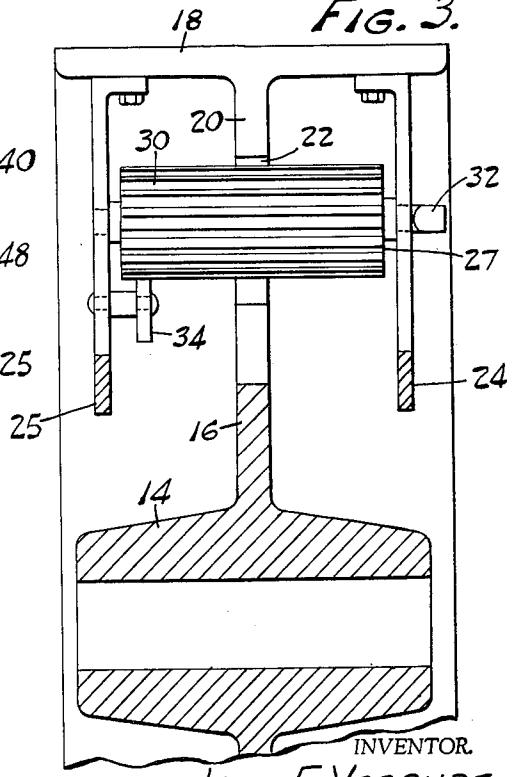


FIG. 3.



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ABRASIVE STRIP HOLDING AND TIGHTENING MECHANISM

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This invention relates to a mechanism for holding and tightening a removable abrasive sheet or strip in place about the periphery of a wheel.

It is an object of this invention to provide a quick acting, dependable and durable mechanism for holding and retaining an abrasive strip in position on a sanding wheel, and for tightening an abrasive strip about a wheel or the like.

Another object of this invention is to provide a holding and tightening mechanism which facilitates changing of abrasive sheets.

A further object of this invention is to provide a holding and tightening mechanism which can accommodate sheets of various abrasive grades.

Still another object of this invention is to provide a holding and tightening mechanism which can accommodate abrasive strips of various widths.

In a presently contemplated, illustrative embodiment thereof, an abrasive strip holding and tightening mechanism of my invention utilizes a pair of rollers carried by a sanding wheel to grip and apply tension to the ends of an abrasive strip. The ends of the strip are passed between the rollers, which are then moved into gripping relation by a quick acting, over center toggle mechanism acting on one of the rollers to lock the strip ends therebetween. The strip is tightened about the wheel by rotating one of the rollers while the gripping relationship therebetween is maintained, in a direction drawing the strip ends further between the rollers. Unlocking of the toggle mechanism separates the rollers, releasing the strip for easy removal and replacement.

These and other objects, advantages and characterizing features of my invention will become more apparent upon consideration of the following detailed description of an illustrative embodiment thereof, in conjunction with the accompanying drawing depicting the same, in which:

FIG. 1 is a fragmentary sectional view of a sanding wheel provided with a holding and tightening mechanism of my invention, taken about on line 1—1 of FIG. 2;

FIG. 2 is a sectional view thereof, on a reduced scale, taken along line 2—2 of FIG. 1; and

FIG. 3 is a sectional view thereof taken along line 3—3 of FIG. 1.

Referring to the drawings, FIG. 1 shows an abrasive strip holding and tightening mechanism of my invention, generally designated **10**, mounted on a sanding wheel **12**. Wheel **12** includes a central hub **14** adapted for attachment to any suitable drive shaft means (not shown), a web portion **16** carried by the hub, and a flanged outer peripheral rim section **18**. The flanged peripheral section **18** is provided with a transverse slot **20** (FIGS. 2 and 3) which extends radially inwardly into web portion **16**. Slot **20** is adapted to receive the ends **17** of an abrasive strip **15** which can be of any type desired. Web **16** also has an opening **22** formed therein, of generally ellipsoidal shape as indicated in phantom in FIG. 1, in communication with slot **20** for purposes explained hereinbelow.

Tightening mechanism **10** includes a pair of support brackets **24**, **25** attached to the underside of flanged periphery **18** and extending radially inwardly thereof on opposite sides of web **16**. Brackets **24**, **25** each have a slot **26** formed therein in axial alignment with slot **20**, for receiving the ends of abrasive strip **15**.

Journaled to support brackets **24**, **25** and extending through web opening **22** are fixed and slidable roller members **27** and **28**, respectively. Fixed roller **27** has a series of longitudinally extending splines **30** formed on its periphery to provide a toothed sheet engaging surface coacting with movable roller **28** to effectively grip and clamp the brasive sheet ends **17** therebetween. The axle of fixed roller **27** has an end **32** extending outwardly from bracket **24** and formed to receive any suitable wrench or similar tool (not shown) for rotation of the fixed roller **27**. Rotation of roller **27** normally is limited, however, to a counterclockwise direction, as viewed in FIG. 1, by the latching action of a weighted, one-way pawl **34** pivotally attached to bracket **25** and gravity urged, against a stop, to its spline engaging position shown in FIG. 1.

Movable roller **28** is formed with a jacket **36** of a suitable resiliently yieldable material providing a friction surface, such as rubber. Jacket **36** is bonded to a core **38**, and provides a resiliently yieldable bearing and backup surface for the relatively unyieldable splines **30** of gear roller **27**. The axle **40** of roller **28** rides in a trackway formed by generally parallel guide slots **42** in brackets **24** and **25** and extending in a direction normal to slots **26**. This trackway provides for lateral movement of roller **28** in opening **22**, towards and away from fixed roller **27**, and opening **22** permits rollers **27**, **28** to project into slot **20**.

To impart movement to roller **28**, there is provided a quick acting, over center toggle mechanism, generally designated **44**, on each side of the wheel web **16**. Each toggle **44** includes a lever arm **46** pivoted between its ends at **47** on the associated bracket **24**, **25**, and a link **48** pivotally connected at its ends to roller axle **40** and to lever arm **46**. Counterclockwise rotation of either lever arm **46**, as viewed in FIG. 1, slides axle **40** along trackway **42** in a direction retracting roller **28** from the gripping position of FIG. 1. Clockwise rotation of either lever arm, as viewed in FIG. 1, causes axle **40** to slide along trackway **42** in a direction driving roller **28** toward gear roller **26**. Toggles **44** are held in the clamping position of FIG. 1 by overcenter action, as clearly shown in FIG. 1, while excessive overcenter rotation of lever arms **46** in a roller closing direction is prevented by stop pins **50** fixed to support brackets **24**, **25**. The resilient yielding of roller jacket **36** accommodates the overcenter action of toggles **44**.

In operation, one of the toggles **44** is actuated to move roller **28** away from roller **27**. An abrasive strip **15** is placed about the periphery **18** of wheel **12**, and strip ends **17** are inserted into slots **20** and **26**, between the separated rollers. With the strip ends in this position, one of the toggles **44** is actuated to shift roller **28** toward gear roller **27**, clamping the strip ends **17** therebetween. Continued rotation of lever arms **46**, past the dead center position of the toggles, brings them against the stops **50**, effectively locking roller **28** in clamping position securing the strip ends **17** between rollers **27** and **28**. The resiliently yieldable jacket **36** of roller **28** accommodates such overcenter movement while reacting to hold roller **28** locked in clamping position.

To tighten the abrasive strip about the wheel, gear roller **27** is rotated, counterclockwise as viewed in FIG. 1, by any suitable wrench or like tool applied to the axle end **32** of gear roller **27**. This also rotates roller **28**, clockwise as viewed in FIG. 1, drawing the belt ends **17** further inwardly between the rollers, tightening the belt while continuing to clamp it and hold it in place.

Whenever it is desired to remove the belt, lever arms **46** are rotated counterclockwise as viewed in FIG. 1, by actuating either of them, separating roller **28** from roller **27** and thereby freeing the belt ends.

Thus it will be appreciated that this invention provides an efficient means of retaining an abrasive belt about the periphery of a wheel. Splines **30** press the strip ends **17** against the resilient surface **36** of roller **28**, providing a positive gripping action. Slipping of roller **27**, and subsequent loosening of the abrasive strip, is prevented by pawl **50**, which however, can be released should it be desirer to rotate roller **27** in the opposite direction. Any variation in the thicknesses of belts used is compensated for by deformation of the resilient jacket **36**, which is adapted to contact roller **27**, or substantially so, in the absence of strip ends therebetween. The resilient jacket **36** also compensates for any wear or looseness which may develop. The over center toggle mechanism allows quick opening and closing of the roller members to facilitate release and clamping of the strip. The strip is securely held at all times but can be tightened at any time without unlocking the mechanism.

The toggle mechanism can be actuated from either side of the wheel for greater convenience. At the same time, (the entire holding and tightening mechanism is confined within the outline of the wheel. The abrasive strip can extend the full width of the wheel. Abrasive strips of different widths can be accommodated, with longer rollers being provided if necessary.

It is to be understood that the foregoing detailed description is given by way of illustration only, and that various modifications and variations of the strip tightening mechanism described in detail herein can be made without departing from the spirit and scope of the invention.

Having fully disclosed and completely described my invention, together with its mode of operation, what I claim as new is:

1. An abrasive strip holding and tightening mechanism comprising:

(a) a wheel having a flanged outer periphery for receiving thereon an abrasive strip;

(b) a pair of bracket members attached to said flanged periphery having a generally radial slot formed therein for receiving the ends of an abrasive strip;

(c) a pair of roller members journaled on said brackets and disposed to retain such strip ends therebetween;

(d) a toggle mechanism operatively connected to one of said roller members for moving the same into and out of strip end clamping relation to the other of said roller members; and

(e) latch means engaging one of said roller members to limit the direction of rotation thereof.

2. A mechanism as set forth in claim **1**, in which said one roller has a resiliently yieldable outer surface and the other roller member has a relatively unyielding gripping surface.

3. A device as set forth in claim **2** in which:

(a) said gripping surface is splined; and

(b) said latch means includes a pawl mounted on one of said brackets for engaging said splines.

4. A device as set forth in claim **2** in which said other roller member has an axial extension adapted to receive a tool for rotation of said other roller member.

5. A mechanism as set forth in claim **1** in which:

(a) said bracket members have a trackway formed therein normal to said slot; and

(b) said one roller member has axial extensions slidably disposed in said trackway, said toggle mechanism providing lateral motion of said one roller.

6. A device as set fort hin claim **5** in which:

(a) said toggle mechanism includes a lever arm mounted on each of said bracket members, and link members extending between and pivotally connected to said lever arms and said one roller member respectively; and

(b) a stop fixed to each of said bracket members to prevent excessive overcenter movement of said lever arms.

7. In a wheel adapted to carry an abrasive strip, a mechanism for holding and tightening an abrasive strip about said wheel comprising:

(a) support brackets carried by said wheel, said brackets providing a trackway;

(b) a resilient roller slidably disposed in said trackway;

(c) a toothed roller journaled on said support brackets adjacent said resilient roller;

(d) means conveying the ends of an abrasive strip between said rollers;

(e) an overcenter toggle mechanism pivoted to one of said support brackets and operatively connected to said resilient roller, said mechanism acting to retain said resilient roller in abutting relationship with said toothed roller to lock such strip ends therebetween;

(f) said toothed roller being disposed for rotation against said resilient roller to draw such strip ends further therebetween; and

(g) a pawl attached to one of said support brackets in engagement with said toothed roller to prevent release of tension on such strip other than by releasing said resilient roller through said mechanism.

8. The combination set forth in claim **7** in which said means includes a radially inwardly extending slot formed in said wheel, said rollers being disposed on opposite sides of said slot in communication therewith.

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