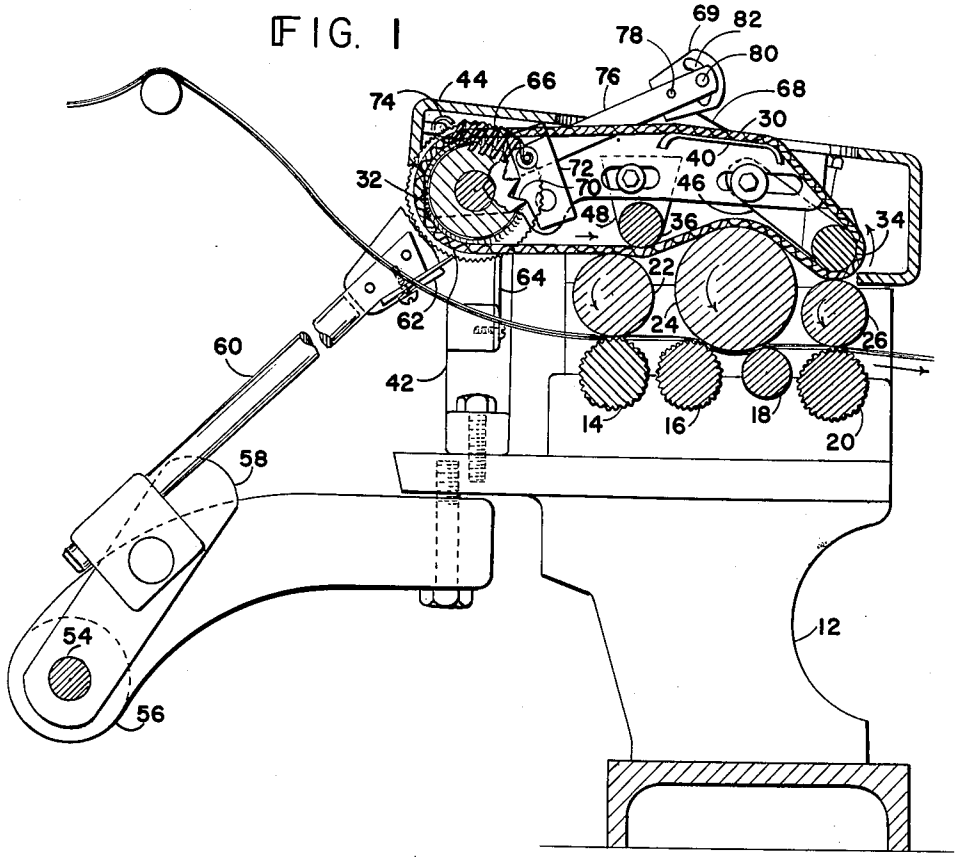
Feb. 21, 1956 D. G. NOILES 2,735,142

CLEARERS

Filed June 17, 1954

FIG. 1



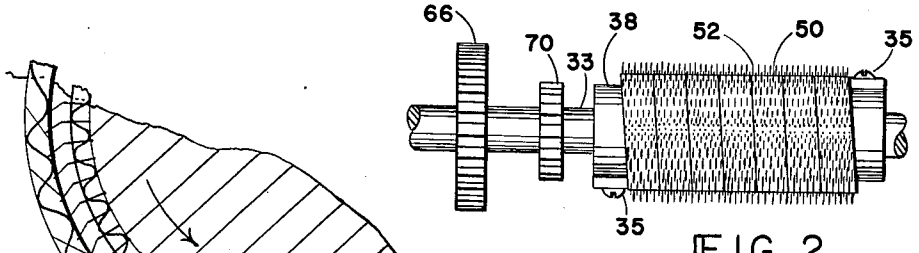


FIG. 2

FIG. 3

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CLEARERS

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7 Claims. (Cl. 19—139)

This invention relates to drafting mechanisms and more particularly to revolving flat clearers for drafting rolls especially on drawing frames and the like.

A drawing frame of the character commonly used in connection with the preparation of textile fibers for spinning usually includes three to five upper and lower rolls between which strands of sliver are fed and by means of which they are drafted. In order to maintain the drafting rolls comparatively free from lint and fly, a cloth clearer belt may be stretched across the upper surfaces of the entire series of top rolls where it rests lightly on them and wipes off the fly carried by them, such belt preferably being both driven to provide a relatively slow movement thereof and having cleaning means associated therewith for continuous removal of lint and fly from the moving surface of the clearer.

Such revolving flat clearers can be quite effective in their cleaning action, especially when driven in a direction opposite to the direction of movement of the drafting roll surfaces upon which they rest. However, the driving of such cloth clearer belts has long been a problem in the art, since the fabric of which they are commonly made has an easily damaged surface which could not be successfully driven against the friction due to the drafting roll surfaces by the means heretofore known to the art without damaging the belt fabric. Accordingly, revolving flat clearers have not gone into universal use in spite of their known effectiveness, and whatever usage does exist has been limited to roll systems where the cloth clearer belt can be stretched tight to provide tractive friction against the driving roll. On contemporary controlled draft drawing systems, which employ rolls of unequal diameters, it is not possible to run the belt tight, and, hence, heretofore the difficulties of driving the belt have precluded the use of the revolving belt clearer on many of the modern drawing elements.

The present invention is especially concerned with the above-described problem and it aims to devise a thoroughly practical solution thereto. The nature of the invention will be readily understood from the following description of a preferred embodiment thereof when read in connection with the accompanying drawings and the novel features will be particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a vertical transverse sectional view through a drawing frame equipped with a clearer mechanism embodying this invention;

Fig. 2 is an elevational view of my novel means for driving the cloth clearer belt; and

Fig. 3 is an enlarged transverse sectional view of said means for driving the cloth clearer belt as shown in Figs. 1 and 2.

Referring first to Fig. 1, the drawing mechanism there shown comprises a roll stand **12** having mounted thereon a series of four bottom drafting rolls **14, 16, 18, and 20,** respectively, and three cooperating upper or top drafting rolls **22, 24,** and **26** running in contact with and driven by

the respective bottom rolls just mentioned. The particular number and arrangement of the drafting rolls is immaterial so far as this invention is concerned. The cloth clearer belt **30** is preferably in the form of an endless loop of textile fabric either woven or felted, and is supported and driven by rolls within the loop thereof including a rear driving roll generally designated **32,** a front supporting roll **34,** and preferably a middle supporting roll **36,** said clearer belt also preferably having within its loop a supporting plate **40.** The rear driving roll **32** has its shaft **33** rotatably mounted in upstanding brackets **42** on roll stand **12** and in turn supports a cover **44** for swinging movement about the axis of roll **32,** said cover having mounted on the sides thereof adjustable brackets **46** and **48** in which are mounted supporting rolls **34** and **36,** respectively.

According to this invention, the boss portion **38** of driving roll **32** has card clothing **50** mounted on its peripheral surface with the large number of sharp, resilient pins **32** covering one surface of said clothing extending outwardly to engage with the cloth clearer belt **30,** the upper portion of said pins **52** above their knee preferably being bent in the direction of movement of said roll **32** and belt **30.** The card clothing **50** may be mounted on driving roll boss **38** by winding a narrow strip thereof helically around said boss and securing the ends thereof to driving roll shaft **33** as by machine screws **35.**

Such novel clearer belt driving roll construction for the first time provides effective belt driving in a direction opposite to the direction of movement of the drafting roll surfaces contacting said belt without either slippage or substantial damage to the cloth clearer belt, the relatively large number of pins passing into the surface or nap of the cloth belt far enough to provide optimum belt driving and yet not penetrating the belt to such an extent as would wear or damage the belt. It will be understood, that although we prefer to employ card clothing for the pin-covered surface of driving roll **32,** other types of pin surfaces may be equally effective.

Clearer belt driving roll **32** is driven preferably from rocking shaft **54** mounted in suitable bearings **56** on roll stand **12** (such rocking shaft being that shaft commonly used in drawing frames for actuating the stop motion) through a ratchet mechanism including a rocking shaft lever **58** and a pawl lever **60** hingedly mounted thereto at one end with its other end rotatably mounted on driving roll shaft **33** for rocking movement relatively thereto. A moving spring pawl **62** is mounted on said pawl lever **60,** cooperating with a fixed pawl **64** mounted on upstanding bracket **42** to engage and rotate a toothed ratchet wheel **66** mounted on driving roll shaft **33** and rotatable therewith. Other means for rotating belt driving roll **32** in the preferred direction at a suitably slow speed of about a revolution per minute to provide a speed of movement of the clearer belt of a few inches a minute may alternatively be used.

In order to provide means for continuously cleaning the surface of the slowly moving clearer belt **30,** as is preferred, a reciprocating comb **68** having supporting side members **69** is provided to engage the upper surface of belt **30** as it passes over supporting plate **40,** said comb being reciprocated in a direction to and fro along the direction of movement of belt **30** by means of a camming mechanism interposed between the belt driving roll **32** and said comb **68.** Such camming mechanism includes a toothed cam **70** mounted on and rotatable with driving roll **32** and cooperating with a cam follower **72** pivotally mounted on the side of cover **44,** such cam follower being yieldingly urged into contact with cam **70** by a spring **74** and being adjustably connected to comb supporting members **69** by a link **76** pivoted at one end to cam follower **72** and adjustably connected to said comb

supporting members 69 so that said comb supporting members 69 with comb 68 may be pivotally adjusted about link pivots 78 by means of machine screws 80 and slots 82.

In operation, with the drafting rolls being rotated in the usual manner to draft fiber therebetween, and with the rocking shaft 54 being operated to swing lever 58 back and forth through a limited arc to swing pawl lever 60 and rotate clearer belt driving roll 32 to drive clearer belt 30 in a direction opposite to the direction of movement of the surfaces of the drafting rolls which it contacts, as shown by the arrows in the drawings, clearer belt 30 is moved at a slow speed of a few inches a minute to continuously clean the fly and lint from the drafting rolls. At the same time, comb 68 is reciprocated through its camming mechanism to pick up the lint and fly from the surface of said belt, the lint and fly accumulated on said comb being removed from time to time by an operator. If at any time it is desired to remove the clearer belt 30 from contact with the drafting rolls, as is necessary when piecing up, clearer frame 44 may be swung upwards while the mechanism is in operation for ready access to the drafting rolls, and then may be lowered again to its operating position to put it back in use.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention may be embodied in other forms such as, for example, a clearer beneath a set of drawing rolls without departing from the spirit thereof or the scope of the appended claims, for example, the invention will be found useful in drafting mechanisms other than drawing mechanisms.

I claim:

1. In a drafting mechanism having a series of drafting rolls, an endless looped clearer belt contacting said drafting rolls, belt supporting and driving means including roll means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt, said belt supporting and driving roll means having a plurality of closely spaced, resilient and sharp belt driving pins mounted on and extending throughout its peripheral surface and extending outwardly therefrom to engage the surface of said endless belt far enough only to drive said belt, and means for rotating said belt supporting and driving roll means to drive said belt.

2. In a drafting mechanism as claimed in claim 1, in which said belt is driven in a direction opposite to the direction of movement of said drafting roll surfaces.

3. In a drafting mechanism having a series of drafting rolls, an endless looped clearer belt contacting said drafting rolls, belt supporting and driving means including roll means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt, said belt supporting and driving roll means having a plurality of closely spaced, resilient and sharp belt driving pins mounted on and extending throughout its peripheral surface and extending outwardly therefrom to engage the surface of said endless belt far enough only to drive said belt, means for rotating said belt supporting and driving roll means to drive said belt, and means driven from said belt supporting and driving roll means for cleaning said belt.

4. In a drafting mechanism having a series of drafting rolls, an endless looped clearer belt contacting said drafting rolls, belt supporting and driving means including roll means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt, said belt supporting and driving roll means having a plurality of closely spaced, resilient and sharp belt driving pins mounted on and extending throughout its peripheral surface and extending outwardly therefrom to engage with the surface only of said endless belt to drive said belt, said belt driving pins being bent in the direction of movement of said belt, and means for rotating said belt supporting and driving roll means to drive said belt.

5. In a drafting mechanism having a series of drafting rolls, an endless looped clearer belt contacting said drafting rolls, belt supporting and driving means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt, said belt driving and supporting roll means including a roll having card clothing mounted on its peripheral surfaces with the closely spaced, resilient and sharp pins of said card clothing extending outwardly to engage the surface only of said endless belt to drive said belt, and means for rotating said belt supporting and driving roll means to drive said belt.

6. In a drafting mechanism having a series of drafting rolls, an endless looped clearer belt contacting said drafting rolls, belt supporting and driving means including roll means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt in a direction opposite to the direction of movement of said drafting roll surfaces, said roll means including a belt supporting roll mounted within the loop of said apron and a belt driving roll mounted within the loop of said belt and spaced from said belt supporting roll, said belt driving roll having card clothing mounted on its peripheral surface with the closely spaced, resilient and sharp pins of said card clothing extending outwardly to engage the surface only of said endless belt to drive said belt, and means for rotating said belt driving roll to drive said belt.

7. In a drafting mechanism having a series of drafting rolls, an endless looped fabric clearer belt overlying and contacting said drafting rolls, belt supporting and driving means including roll means mounted within the loop of said belt for supporting said belt in contact with the surfaces of said drafting rolls and for driving said belt in a direction opposite to the direction of movement of said drafting roll surfaces, said roll means including a belt supporting roll mounted within the loop of said apron and a belt driving roll mounted within the loop of said belt and spaced from said belt supporting roll, said belt driving roll having card clothing mounted on its peripheral surface with the closely spaced, resilient and sharp pins of said card clothing extending outwardly to engage the surface only of said endless belt to drive said belt means for rotating said belt driving roll to drive said belt, and means for cleaning said belt including reciprocating comb means engaging the surface of said belt, and camming means for reciprocating said comb means driven by said belt driving roll.

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