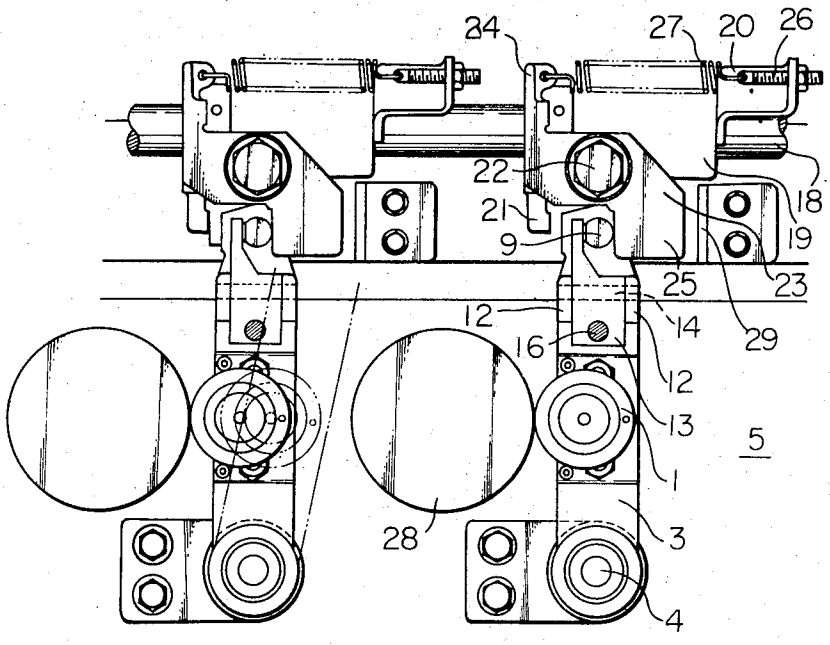
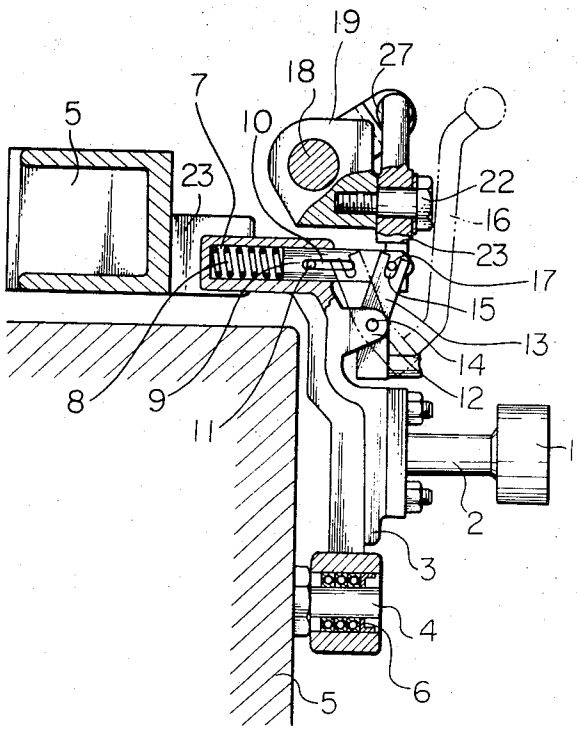
Oct. 31, 1972 SADAO SANJO ET AL 3,701,608
TEXTILE-FORWARDING UNITS WITH PRESSURE ROLLERS OPERABLE JOINTLY AND INDIVIDUALLY
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Fig. 1



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Fig. 2



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3,701,608

TEXTILE-FORWARDING UNITS WITH PRESSURE ROLLERS OPERABLE JOINTLY AND INDIVIDUALLY

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U.S. Cl. 226—155 4 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for engaging or disengaging driven pressure rollers with rotating driving rollers provided in a plurality of the yarn-forwarding units. The former rollers are engaged or disengaged with the latter rollers by the movement of a single common shaft in all units and in case of an accident one or more driven rollers are engaged or disengaged individually with the driving rollers without the movement of the shaft.

This invention relates to a textile machine for drawing, twisting and spinning one or more yarns, and more particularly it relates to tetxile forwarding units for advancing yarn from one operation to another.

Generally in the textile machines such as stretching machines, twisting machines, spinning machines and the like make wide use of an apparatus in which one roller (hereinafter referred to as a pressure roller) rotating freely covered with a resilient, expansible material thereon is engaged with another roller (hereinfter referred to as a rotating roller) rotated by a driving means and between both rollers one or more yarns are nipped or pinched to be transferred and supplied to a succeeding station or operation.

In such an apparatus if the pressure roller continues to press against the rotating roller during a period in which the apparatus is not in operation the pressure roller will become deformed because of the resilient, expansible property of the pressure roller coverings so that an evenly applied pressure of the pressure roller against the rotating roller can not be obtained when subsequent operation is resumed. It is, therefore, necessary that the pressure roller should be kept apart from the rotating roller during periods of non operation. When the rotating roller is heated, the pressure roller should not be positively pressed against the rotating roller so as to prevent damage of the pressure roller surface during the non-operation periods. In such a case, it is very convenient that the pressure rollers in a number of unit devices of this type are concurrently kept apart from the rotating rollers and on the other hand the pressure rollers are concurrently engaged with the rotating roller when operation is resumed. Further in the event that undesired conditions, such as entanglement of the broken yarns around the rollers, exist in a part of the unit devices, it is required that one or more pressure rollers should be kept apart from the rotating rollers having such as entanglement, breakage of yarns, for the elimination thereof while the other pressure rollers continue to be engaged with the other rotating rollers in a normal condition in the other part of the unit devices.

It is therefore an object of this invention to provide an apparatus for easily engaging or disengaging all of the pressure rollers or some of them from the rotating rollers provided in a number of unit devices in a textile machine.

It is another object of this invention to provide an apparatus which is not complex and compact in construction and moreover not expensive to produce.

It is still another object of this invention to provide an apparatus in which the contact pressure of the pressure rollers against the rotating rollers can be easily adjusted individually.

According to this invention in an apparatus for engaging or disengaging the pressure rollers, all of them or a number of them, from the rotating rollers provided in a plurality of unit devices. A roller system comprises a swingable arm pivoted around a pin secured to a frame, a pressure roller supported by the arm and rotating freely, a rotating roller, which can be engaged or disengaged with the pressure roller and rotated by a driving means. A pin is mounted reciprocably on the arm and a cam lever is positioned to normally push the pin in a direction causing the pressure rollers to come into contact with and engage with the rotating rollers. A shaft supports the cam lever swingably around a bolt secured to the shaft. A bracket is secured to the shaft. The bracket has a projection at the lower portion thereof in the position so that the projection pushes the arm for the pressure roller to be disengaged with the rotating roller when the shaft moves in the direction that the pressure roller is disengaged with the rotating roller.

Other features and advantages of the apparatus in accordance with the present invention will be better understood as described in the following specification and appended claims, in conjunction with the following drawings in which:

FIG. 1 is a fragmentary elevational cross-section view of the apparatus in accordance with the invention, illustrating a state in which the pressure roller is engaged with the rotating roller.

FIG. 2 is a side elevational view partly in section of an apparatus in accordance with the invention, illustrating a state in which a cam lever pushes a pin for engaging the pressure with the rotating roller.

Referring to the drawings, a pressure roller **1** is rotatably mounted on a shaft **2** provided at the middle portion of an arm **3** by means of bearings not shown. The arm **3**, at the lower end thereof, is rotatably mounted on a pivot shaft **4** secured to a machine frame **5** by means of bearings **6**, and therefore the arm **3** is swingable on the shaft **4**. At the upper end of the arm **3** a bore **7** is provided in parallel with the pivot shaft **4** and in the bore **7** a coil spring **8** is inserted in the back portion thereof and a pin **9** is also inserted in the front portion thereof so that pin **9** is pushed out or biased forwardly or outwardly of the bore **7** by spring **8**. A slot **10** which is closed at both ends thereof is provided on the pin **9**, along its longitudinal axis. Through slot **10** extends another pin **11** which is fixed to the wall of the bore **7** in a position perpendicularly to the longitudinal axis of the pin **9**. Therefore, the pin **9** is prevented from being pushed axially completely outwardly of the bore **7**. At the upper portion of the arm **3** below the bore **7** are provided two brackets **12** which support a pivoted lever **13** therebetween by a pivot pin **14** fixed to the brackets **12**. This lever **13** is swingable around the pivot pin **14**. At the upper end of the pivoted lever **13** is provided a slot **15** which is open at an upper portion or end thereof while at the lower portion of this lever is provided a handle **16**. A pin **17** provided at the front end of the pin **9** is fitted freely through said slot **15** so that the pin **9** in the bore **7** carries out a reciprocating motion, in the bore **7**, when the lever **13** is manually swung by the handle **16**.

A main shaft **18** is provided movable in its longitudinal direction and is supported for axial movement at will by a supporting member not shown installed with the frame **5**. On the shaft **18** is mounted and fixed a bracket **19** on

which is formed a projection **20** at the right upper portion thereof and another projection **21** at the left lower portion thereof. On the bracket **19** is mounted a cam lever **23** swingable around a pivot or bolt **22** secured to the bracket **19**. A projection **24** is provided at the left upper portion of the cam lever **23** while another projection **25** is provided at the right lower portion thereof which is in contact with the biased pin **9** at a side opposite to the side from which the side pin **17** extends. An adjusting screw **26** is screwed on and supported by the projection **20** of the bracket **19** and a coil spring **27** is disposed between the tip of the screw **26** and the projection **24** of the cam lever **23**. The spring **27** acts to pull or bias both the tip of the screw **26** and the projection **24** so that the cam lever **23** tends to rotate around its pivot **22** in a clockwise direction, pressing the pin **9**, whereby the pivoted lever **13** and the arm **3** supporting the pressure roller are forced to be swung in a counterclockwise direction about the pivot shaft **4** and the pressure roller **1** is engaged with a driven rotating roller **28** mounted on the frame **5** and rotated by a driving means, not shown. The pressure of the pressure roller **1** against the rotating roller **28** can be made to vary optionally by adjusting the pull of the biasing spring **27** which can be effected by the adjustment of the screw **26**. A stop **29** is secured to the frame **5** and prevents the arm **3** from swinging past a definite position in a clockwise direction, about the shaft **4**, and on the other hand, the swing motion of the arm **3** in a counterclockwise direction is limited by the projection **21** of the bracket **19**.

When a number of the pressure rollers **1** arranged in respective units or devices are required to be concurrently kept separate from the rotating rollers **28** engaged therewith, the movement of the shaft **18** in a direction toward the right in FIG. 1 causes all of the pressure rollers **1** to be kept separated from the respective rotating rollers **28** through the swing motion of the arms **3** in a clockwise direction about the respective shafts **4** by means of the individual projections **21**. When the operation must be resumed, the movement of the shaft **18** in a direction toward the left causes the pressure rollers **1** to be disposed in their original engaged condition with the rotating rollers **28** again. In a drawing or stretching textile machine, the pressure rollers **1** in a number of unit devices can be concurrently engaged or disengaged with the rotating rollers **28** by the single axial movement of the shaft **18** because the pressure rollers **1** and the rotating rollers **28** are provided in a number of respective unit devices and the shaft **18** actuates the pressure rollers in common and they can be actuated singly in the unit devices.

Further, when the pressure roller **1** is required to be kept separate from the rotating roller **28** in some of the unit devices, the pin **9** is actuated into the bore **7** backwardly by holding up the respective individual handles **16** so that the pin **9** is no longer pushed or biased by the cam lever **23** because the spring **27** does not act on the arm **3**. Therefore, the arm **3** can be swung freely in a clockwise direction about the shaft **4**, thereby the pressure roller **1** is able to be kept apart from its associated rotating roller **28**. Moreover when the pressure roller **1** is to be again engaged with the rotating roller **28**, the swing motion of the arm **3** in a counterclockwise direction about the shaft **4** restores the engaged position of the pressure roller **1** with the rotating roller **28** in which outward biasing of the pin **9** from the bore **7** is not prevented by the back face of the cam lever **23**. Resumption of the outwardly biased position of the pin **9** can be carried out with little deformation of the pressure roller **1** because the recovery force of the spring **27** is not great, and at the same time the pin **9** is pushed out by the restoring force of the spring **8** and again comes to its original state in which it is pushed by the cam lever **23**. The pressure roller **1** is engaged with the rotating roller **28**. Furthermore, in the state in which the pin **9** is kept apart from engaging with the cam lever **23**, if the shaft **18** is moved in a direction toward the right in FIG. 1, the cam lever **23** is moved concurrently in a direction toward the right and the pin **9** which has been pushed by the back face of the cam lever **23** is no longer pushed thereby so that it is pushed outwardly from the bore **7** by the recovery force of the spring **8**, and is then engaged with the cam lever **23** again.

It will be remembered that in controlling many units each pin **9** is engaged with the cam lever **23** by one movement of the shaft **18**.

As mentioned above in accordance with this invention those skilled in the art will readily recognize that the pressure roller can be easily released or kept apart from the pressing state by one operation and is easily made to resume the state in which it is in operation so that working hours of the rollers and the labor necessary for causing the pressure roller to be engaged or disengaged with the rotating roller can be decreased sharply. Furthermore, the pressure roller can be engaged or disengaged with the rotating roller in every unit device so that even if trouble such as breakage of the yarn, entanglement in the roller and the like occurs partially by accident, the pressure roller can be easily kept apart from the associated rotating roller only in the unit device having trouble without stopping of the other unit devices. Therefore, surplus supplying or transferring of yarn can be minimized and yarn wrapped around the roller can be rapidly removed. Furthermore, the contact pressure of the pressure rollers against the respective rotating rollers can be easily adjusted respectively individually.

What is claimed is:

1. In a textile processing machine, a plurality of textile-forwarding units for delivering a yarn from one operation to another; each unit comprising a driven roller and a pressure roller for nipping therebetween yarn forwarded longitudinally from one position to another, means rotationally mounting said driven roller, a pivotally mounted arm supporting said pressure roller and movable to a first operative position in which said pressure roller engages said driven roller for nipping said yarn and to a second operative position in which said pressure roller is separated and spaced from said driven roller, means in each textile-forwarding unit continuously biasing said arm to said first position; means for selectively jointly moving to said second operative position all the pivotally mounted arms each mounting a pressure roller in said textile-forwarding units; and means operable at will independently of the last-mentioned means to move said pivotally mounted arms of said units individually temporarily from said first position to said second position and back from said second position to said first position and to selectively move said arms individually at will to said first position when said last-mentioned means has moved all of said arms jointly to said second position.

2. In a textile processing machine according to claim **1**, in which said last-mentioned means comprises an axially movable shaft moved axially selectively in opposite directions, and means spaced axially on said shaft engageable with respective ones of said means operable at will on said arms for pivoting said arms to said second position when said shaft is moved axially in one direction, means mounted axially spaced on said shaft at each textile-forwarding unit restoring said arms to said first position when said shaft is moved in a direction opposite to the first-mentioned direction subsequently to moving of said shaft in said first-mentioned direction.

3. In a textile processing machine according to claim **2**, in which said means operable at will comprises in each of said arms a reciprocably mounted pin axially biased to a position in which it is in the path of travel of said means spaced axially on said shaft, and means biasing said pin to said position.

4. In a textile processing machine according to claim **3**, in which said means operable at will in each unit comprises a manually operated lever to move axially said pin away from said position in which it is in the path of

travel of said means spaced axially on said shaft and for moving said arm pivotally between and to said operative position thereof.

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