Dec. 20, 1955 J. P. HANSEN 2,727,401

CARD DRIVING MECHANISMS

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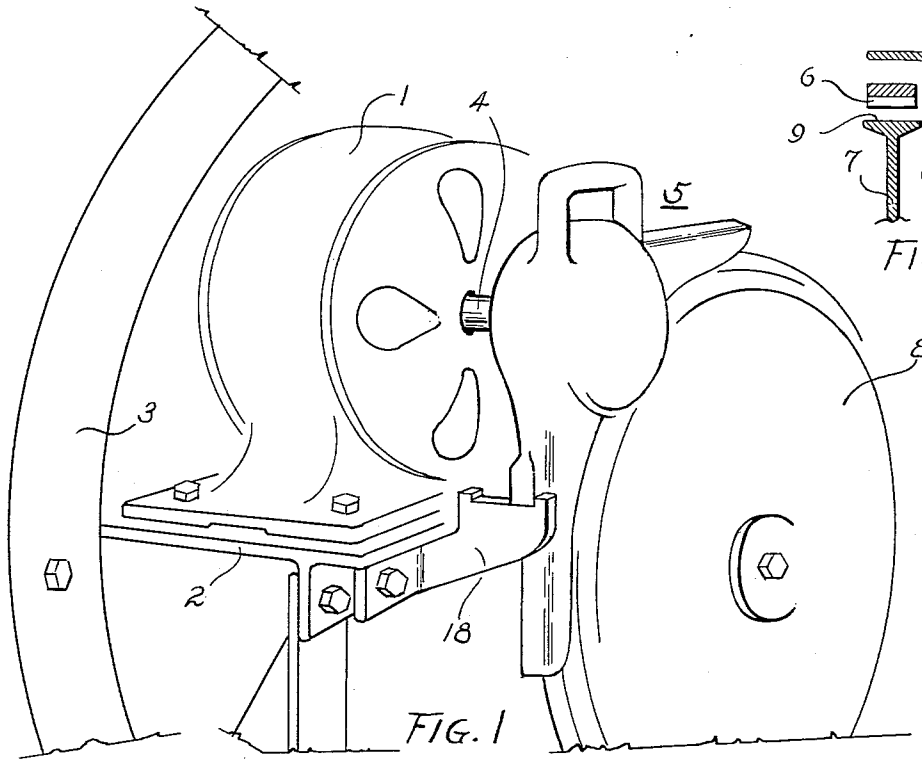


FIG. 1

FIG. 2

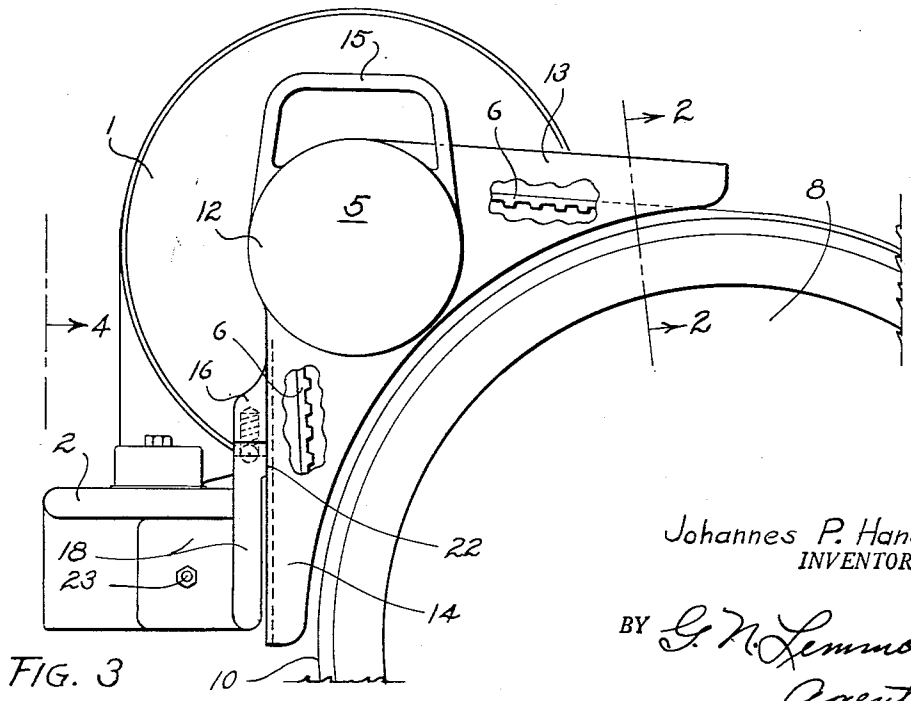


FIG. 3

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CARD DRIVING MECHANISMS

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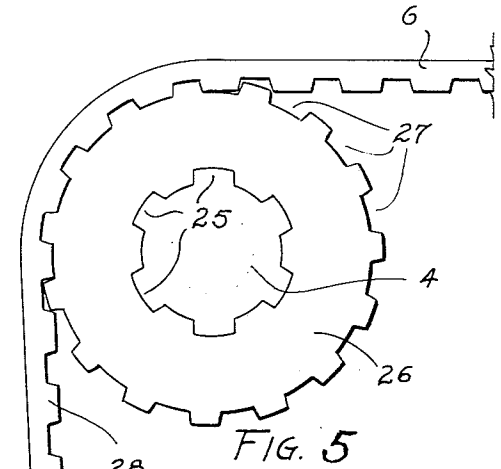


FIG. 5

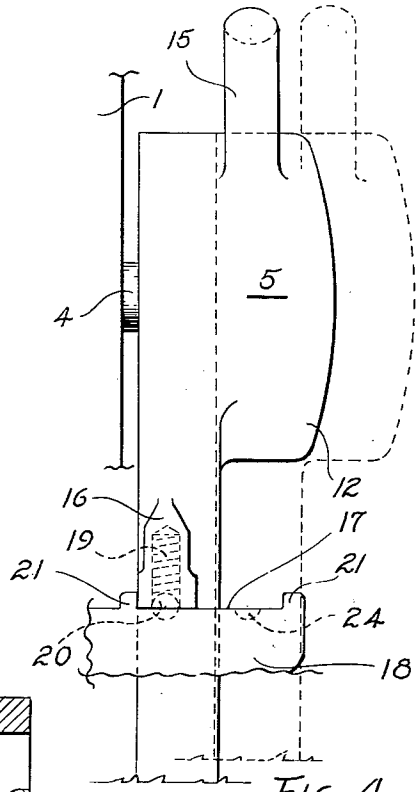


FIG. 4

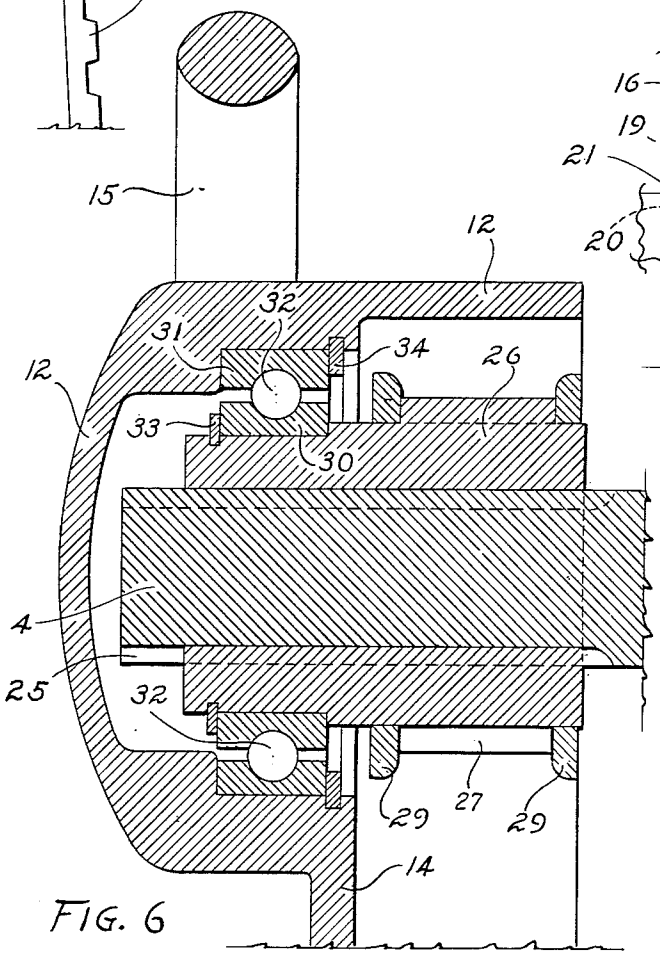


FIG. 6

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CARD DRIVING MECHANISMS

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14 Claims. (Cl. 74—242)

This invention relates to textile machinery, and particularly to operating a carding machine by means of an electric motor, which is directly connected to the card, through devices which make such operation easier and safer.

It has long been customary to drive a card from an overhead shaft and pulley connected by a shiftable belt to a pair of adjacent pulleys on the main driving shaft of the card, one pulley being loose and one being tight. On the outside of the loose pulley and integral with it is a third pulley grooved to receive and drive a rope belt which is installed when required to drive the stripper which is used occasionally to clean the cylinder of the card. This requires stopping and starting the card several times a day and also operating the cylinder at a slower speed during the stripping operation.

It is often desired to change from an overhead drive to an electric motor connected directly to the card, and one purpose of my invention is to provide a motor driven mechanism which gives a positive drive for the card during normal operation, which can be started and stopped smoothly and easily, which gives control at reduced speeds for stripping, which is simple, low in cost, and adaptable for use with many different types of cards, which has the moving parts well protected against interference from extraneous objects, and which protects operators and others from accidental personal injury.

Referring to the drawings, Figure 1 is a diagonal perspective view of a device embodying my invention in one of its forms as applied to a card;

Figure 2 is a cross section on line 2—2 in Figure 3;

Figure 3 is a front view similar to Figure 1 but showing more details;

Figure 4 is a side elevation of the device from direction 4 in Figure 3;

Figure 5 is a larger size cross section of the pinion, belt and shaft, showing the interlocking of these members, the cross hatching being omitted for clarity; and

Figure 6 is a large size longitudinal section through the center of the pinion and associated members.

In Figure 1, the motor 1 is mounted on a base 2 which base is secured, by means not shown, to the frame of a card as indicated at 3. Upon the shaft 4 of the motor is supported the belt shifter 5. The belt 6 drives, selectively, the tight pulley 7 and/or the loose pulley 8. As shown in Figure 2, the tight pulley 7 has a single flat belt surface 9 while the loose pulley 8 has a flat belt surface 10 and also a grooved pulley 11 for driving the rope stripper belt, as is customary for cards.

Referring also to Figures 3, 4, 5 and 6, the pinion shifting means or belt shifter 5 includes the housing 12, two belt guards 13, 14, and the handle 15, all of which are preferably made of a single casting. Integral with guard 14 is a projection 16 which has a bottom surface to engage with the top surface 17 on bracket 18. In projection 16 are housed compression spring 19 and ball 20. Ball 20 is engageable with a depression 24 in bracket 18 at each end of its travel and thus acts to prevent unintentional motion

of shifter 5. Stops 21, 21 on bracket 18 limit the travel of shifter 5. Bracket 18 also has a vertical flat surface 22 which engages a corresponding surface on shifter 5. Bracket 18 is removably bolted securely to motor base 2 by one or more bolts 23.

Referring to Figures 5 and 6, the motor shaft 4 is keyed and upon it is supported pinion 26, which is held against rotation by one or more keys 25—25 so that a driving member in the form of a pinion 26 is slidable along the shaft 4 but is not rotatable thereon. The outer periphery of pinion 26 has grooves 27—27 to interlock with dents 28—28 on belt 6; and flanges 29, 29 which are secured to pinion 26 prevent sidewise displacement of belt 6 on pinion 26.

Ball races 30, 31 and balls 32—32 form a ball bearing assembly which is securely held by snap ring 33 to pinion 26; and snap ring 34 holds the ball bearing securely positioned in housing 12, so that shifter 5 is supported, principally, through balls 32—32 upon pinion 26 which in turn is supported upon shaft 4. And since surfaces 17 and 22 on bracket 18 prevent rotation of shifter 5, the shifter remains stationary even though the motor turns pinion 26. This supporting of the stationary shifter by the revolving pinion is one of the features of my invention. At times a small part of the weight of the shifter may rest on bracket 18, but this is immaterial.

The dents 28—28 on belt 6 fit into grooves 27—27 of pinion 26 and so belt 6 cannot slip on pinion 26 even though the peripheral contact area is short. But the flat tops of dents 28—28 engage a large part of the peripheries 9, 10 of pulley 7 and/or pulley 8. And so belt 6 may be shifted between pulleys 7 and 8 as readily as though it were a regular flat belt.

This shifting is easily and safely accomplished by means of handle 15, while the nonrotating housing 12 and and guides 13, 14 protect the operator. And thereby the various steps in starting and stopping the card, applying, using and removing the stripper, and again starting the card, can all be easily and safely accomplished by the use of this invention.

If desired, one or more suitable V-belts could be used in place of the toothed belt described in the specification, since one object is to have the pinion, despite its small angular contact with the belt, nevertheless drive the belt or belts positively, and a second object is to have the belt or belts shift easily from loose to tight pulley and back again. And one skilled in the art could make various other changes in the forms of the device as herein shown without departing from the spirit and purposes of this invention.

I claim:

1. In combination with a card having a tight driving pulley, a loose pulley adjacent thereto upon the same main drive shaft, and a stripper pulley integral with the loose pulley for periodically receiving and driving the stripper belt; a driving mechanism comprising a motor with an extended shaft, a toothed pinion slidably keyed to the motor shaft for longitudinal motion thereon, and a toothed belt positively driven by the pinion, the inner surfaces of said toothed belt being shiftably engaged with the said tight and loose pulleys to drive either or both of said pulleys, and belt shifting means connected with the pinion for sliding the pinion upon the motor shaft.

2. In combination with a card having a tight driving pulley, a loose pulley adjacent thereto upon the same shaft, and a stripper pulley integral with the loose pulley for periodically receiving and driving the stripper belt; a driving mechanism comprising an electric motor with an extended shaft, a pinion slidably keyed to the shaft for longitudinal motion thereon, belt means positively driven by the pinion and also shiftably engageable with either or both of the said tight and loose pulleys to drive either or

both of said pulleys, and a non-rotating belt shifting member mounted on the pinion and connected thereto for sliding the pinion upon the motor shaft.

3. A card driving mechanism as in claim 2, wherein the belt shifting member includes a housing over the pinion and at least one belt guard portion extending out from the housing along the belt means.

4. A card driving mechanism as in claim 2, wherein the belt-shifting member includes a housing for the pinion combined with two divergent guard portions which protect the belt means.

5. A card driving mechanism as in claim 2, wherein the belt shifting member includes a housing over the pinion and a handle portion connected with the housing.

6. A card driving mechanism as in claim 2, wherein the connection between the pinion and the belt shifting member is a bearing on the pinion which at least partially supports the belt shifting member and which positions it relative to the pinion.

7. A card driving mechanism as in claim 6, wherein the bearing comprises a ball bearing with an inner race and an outer race, the inner race being held to the pinion and the outer race being held to the belt shifting member.

8. In combination with a card having a tight drive pulley and a loose pulley adjacent thereto upon the same main drive shaft, and integral with the loose pulley, a stripping pulley for periodically receiving and driving the stripper belt; a motor with its keyed shaft parallel to the main drive shaft, a toothed pinion supported by the keyed motor shaft and slidably keyed thereto, a toothed belt continuously engaged with the toothed pinion and also engaged with the smooth periphery of the tight and/or the loose pulley, a housing covering the pinion which housing has supported thereon a handle whereby the pinion may be slidably moved on the motor shaft so that the belt will be transferred thereby from one pulley to the other.

9. A card driving mechanism comprising a rotatable driving shaft, a driving member mounted on said shaft, said member being rotatable with said shaft and being slidable axially thereof, shifting means operably related with said member so that predetermined movement of said shifting means imparts movement to said member in a direction axially of said shaft, a driven shaft disposed in spaced parallel relation to said driving shaft, a pair of pulleys mounted on said driven shaft, and a driving belt for establishing an operative relationship between said driving member and said pulleys, axial movement of said driving member being effective to shift said belt from one to the other of said pulleys.

10. A card driving mechanism comprising a rotatable driving shaft, a driving pinion mounted on said shaft, said pinion being rotatable with said shaft and being slidable axially thereof, pinion-shifting means operably related with said pinion so that predetermined movement of said pinion-shifting means imparts movement to said pinion in a direction axially of said shaft, said pinion being rotatable relative to said pinion shifting means, a driven shaft spaced from said driving shaft, a tight pulley on said driven shaft, a loose pulley adjacent said tight pulley and coaxial therewith, and a driving belt for establishing an operative relationship between said driving pinion and said tight and said loose pulleys, axial movement of said driving member being effective to shift said belt from one to the other of said pulleys.

11. A card driving mechanism comprising a rotatable driving shaft, a driving member mounted on said shaft and having a pair of spaced peripheral flanges thereon, said member being rotatable with said shaft and being slidable axially thereof, bearing means operably related with said member, shifting means operably related with said bearing means, said bearing means being effective to accommodate relative rotary movement between said member and said shifting means and to prevent substantial relative axial movement therebetween, a pair of pulleys coaxially arranged with respect to each other and disposed in spaced relation to said driving member, and a driving belt interrelating said driving member and said pulleys, said belt being interposed between said flanges so that axial movement of said driving member moves said belt axially of said pulleys without causing substantial movement of said belt axially of said driving member.

12. A card driving mechanism comprising a rotatable driving shaft, a driving pinion mounted on said shaft, said pinion being rotatable with said shaft and being slidable axially thereof, bearing means mounted on said pinion, pinion-shifting means mounted on said bearing means, said bearing means being effective to accommodate relative rotary movement between said pinion and said pinion-shifting means and to prevent relative axial movement between said pinion and said pinion-shifting means, a rotatable driven member disposed in spaced relation to said pinion, a driving belt disposed about said driving pinion and said driven member and establishing an operative relationship therebetween, and means for preventing relative movement between said belt and said pinion in a direction axially of said pinion so that axial movement of said pinion causes said belt to move axially relative to said driven member.

13. A card driving mechanism comprising a rotatable driving shaft, a driving pinion mounted on said shaft and having a pair of spaced peripheral flanges thereon, said pinion being rotatable with said shaft and being slidable axially thereof, an inner bearing race mounted on a portion of said pinion and secured against movement in a direction axially of said pinion, an outer bearing race disposed about said inner bearing race, the adjacent surfaces of said races being configured to confine a plurality of ball bearings therebetween, means cooperable with said outer bearing race for imparting movement thereto in a direction axially of said pinion thereby to slide said pinion along said shaft, a movable driven member disposed in spaced relation to said pinion, and a flexible continuous driving means for establishing an operative relationship between said pinion and said driven member, axial movement of said pinion causing movement of said driving means relative to said driven member but not relative to said pinion.

14. A card driving mechanism comprising an axially adjustable rotatable member, a pair of coaxial adjacent rotatable members spaced from said axially adjustable member, a continuous driving belt for establishing an operative relationship between said axially adjustable member and said pair of rotatable members, manually controllable shifting means mounted on said axially adjustable rotatable member for imparting axial movement thereto, and means interrelating said belt and said axially adjustable member so as to prevent substantial relative movement between said belt and said axially adjustable member in a direction axially thereof, said belt being movable in a direction axially of said pair of rotatable members in coordination with axial movement of said axially adjustable member whereby said belt is shifted from one to the other of said pair of rotatable members.

References Cited in the file of this patent

UNITED STATES PATENTS

378,088	Foote	Feb. 21, 1888
419,531	Mallett	Jan. 14, 1890
452,848	Moorehouse et al.	May 26, 1891
1,414,290	Larsh	Apr. 25, 1922