July 28, 1931. E. W. NETHERLAND ET AL 1,816,738

STOP MOTION MECHANISM

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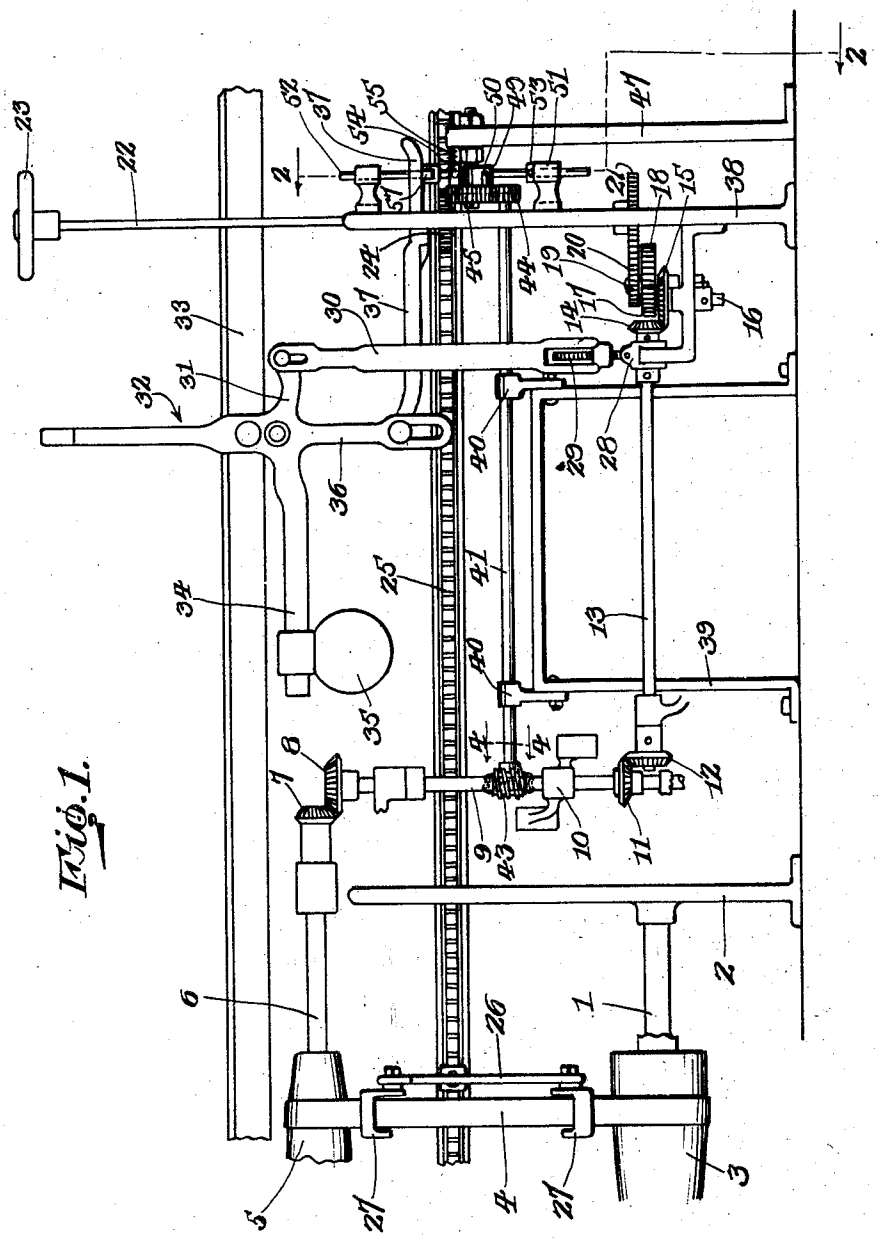


Fig. 1.

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Fig. 2.

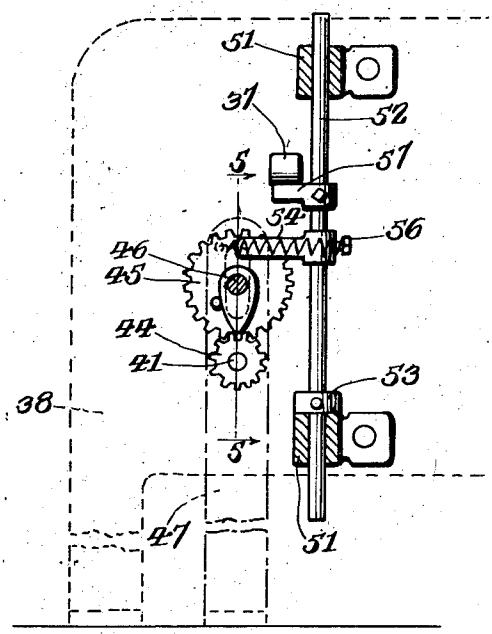


Fig. 3.

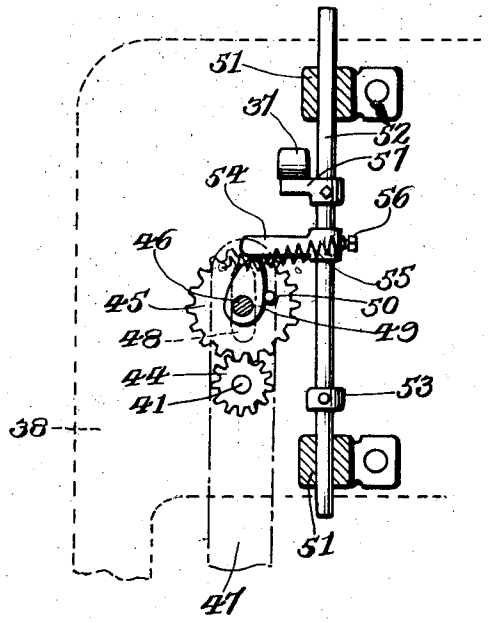


Fig. 4.

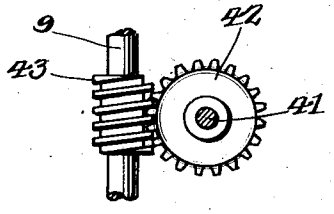


Fig. 5.

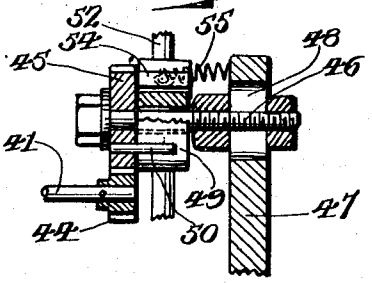
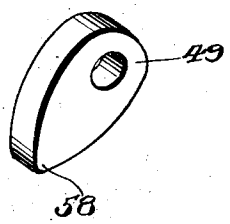


Fig. 6.



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UNITED STATES PATENT OFFICE

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STOP MOTION MECHANISM

Application filed February 14, 1930. Serial No. 428,399.

This invention relates to roving frames, more particularly to a stop motion mechanism therefor, and has for its primary object to provide, in a manner as hereinafter set forth, a mechanism of such class by means of which a roving frame may be momentarily stopped when a predetermined number of layers of roving have been wound on the bobbin carried thereby.

A further object of the invention is to provide a stop motion mechanism for the purpose aforesaid which is operated independently of the cone rack, thereby permitting adjustment of the latter as atmospheric or other conditions may require, without affecting the operation of the stop motion mechanism with respect to the number of layers of roving on the bobbin.

A further object of the invention is to provide a stop motion mechanism capable of functioning in the manner aforesaid, which is simple in construction with the parts thereof substantially free from wear, and which includes a speed governing gear or pinion which may be changed as desired, to provide for a selective ratio in the operation of the stop motion mechanism with respect to the number of layers of roving on the bobbin.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more particularly described, and as illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that the description and drawings are to be taken as illustrative and that the invention is intended to be limited only by the scope of the claims hereunto appended.

In the drawings in which like numerals are employed to designate like parts throughout the same:—

Figure 1 is a fragmentary elevation of a roving frame showing an embodiment of my invention in association therewith.

Figure 2 is a vertical section taken at a point indicated by the line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 2 showing the operation of the stop motion mechanism in its actuation of the trip arm.

Figure 4 is a detailed section taken at a point indicated by the line 4—4 of Figure 1.

Figure 5 is a detailed section taken at a point indicated by the line 5—5 of Figure 2.

Figure 6 is a detailed perspective view of the stop motion mechanism cam.

In the accompanying drawings there is shown a portion of a roving frame which is illustrated and described only in sufficient detail to permit a clear understanding of the operation of my improved stop motion mechanism with respect to the roving frame. The roving frame as illustrated includes a cone shaft 1 having one end thereof journaled in the forward end frame member 2 of the machine. Mounted on the cone shaft 1 is the bottom cone 3 which is driven by an endless belt 4 which extends around the cone 3 and also around the top cone 5, the taper of which is oppositely disposed with respect to the taper of the bottom cone 3. The top cone 5 drives the belt 4 and also operates a cone shaft 6 which is provided at one end with a beveled gear 7. Power is applied to the top cone 5 by means of a suitably geared main drive shaft, not shown.

Meshing with the gear 7 is a mutilated or skip gear 8 which is fixedly secured to the upper end of a vertically disposed contact shaft 9. The contact shaft 9 is provided with a builder dog of usual construction and is further provided with a beveled gear 11 which meshes with a similar bevel gear 12 carried by a shaft 13 extending longitudinally of the machine. At the rearward end thereof, the drive shaft 13 is provided with a bevel gear 14 which meshes with a bevel gear 15 mounted on a vertically disposed stub-shaft 16. Also mounted on the stub-shaft 16 is a pinion 17 which meshes with a gear 18 mounted on a vertically disposed stub-shaft 19. Also mounted on the stub-shaft 19 is a pinion 20 which meshes with a gear 21 mounted on a vertically disposed hand wheel shaft 22. The hand wheel shaft 22 is provided with a hand wheel 23 at its upper end and intermediate its ends is provided with a gear 24 which meshes with and operates a cone rack 25 extending longitudinally of the machine.

Connected with the cone rack 25 is a belt shifting element 26 which is provided with fingers 27 in engagement with the belt 4. The shaft 13 is provided with a suitable joint, the housing of which is indicated at 28 and projecting upwardly from the housing 28 is an externally threaded rod 29. In threaded engagement with the rod 29 is the lower end of a link 30, the upper end of which is pivotally connected to a rearwardly projecting arm 31 on a lever element indicated generally at 32 and pivotally connected with the top frame member 33 of the machine. Oppositely disposed with respect to the arm 31 is a relatively long arm 34 which is preferably provided with a slidably mounted weight 35. The lever element 32 is provided with an arm 36 which projects downwardly at right angles to the arms 31 and 34 and to the lower end of which is secured a rearwardly projecting trip arm 37.

Upon the actuation of the trip arm 37 in an upward direction, the gear 14 is lifted from engagement with the gear 15 whereby the operative connection is broken between the contact shaft 9 and cone rack 25. All of the foregoing elements are of old and well known construction and form no part of the present invention except in combination.

Disposed between the forward end frame member 2 and the rearward end frame member 38 is a substantially inverted, U-shaped support 39, upon which is mounted a pair of spaced bearings 40 for a longitudinally extending shaft 41. At the forward end thereof, the shaft 41 is provided with a worm gear 41 which is in permanent mesh with a worm 43 mounted on the contact shaft 9. At the rearward end thereof, the shaft 41 is provided with a pinion 44 which is in mesh with a gear 45 loosely mounted on a stub-shaft 46 extending from an upright support 47 disposed rearwardly of the end frame member 38. The support 47 is formed with a vertically extending slot 48 through which the stub-shaft 46 extends to provide for vertical adjustment of the gear 45. By adjusting the gear 45, various sizes of pinions 44 may be employed in order to vary the ratio between the shaft 41 and gear 45.

Rotatably mounted on the stub-shaft 46 is a cam element 49 and projecting into the path of the cam element 49 is a pin 50 which projects from the rearward face of the gear 45.

Projecting rearwardly from the rearward end frame member 38 is a pair of spaced bearings 51, through which a vertically disposed shifting rod 52 loosely extends. The rod 52 is provided with a longitudinally adjustable collar 53 which normally rests on the lowermost bearing 51.

Carried by the rod 52 is an elongated dog 54, the free end of which is maintained in engagement with the rear face of the gear 45 by means of a spring 55, the respective ends of which are secured to the support 47 and a set screw 56 projecting rearwardly from the dog 54. By means of the set screw 56, the dog 54 may be adjusted longitudinally of the rod 52. Disposed above the dog 54 is a lug 57 which is longitudinally adjustable on the rod 52 and which projects beneath the trip arm 37, crosswise of the latter.

In the operation of the roving frame, motion is imparted to the cone rack 25 through the gear and shaft mechanism connecting the same with the contact shaft 9. Simultaneously with such operation, the shaft 41 is rotated by means of the worm gear 42 which is in mesh with the worm 43 carried by the contact shaft 9. The rotation of the shaft 41 operates the pinion 44 and gear 45 whereby the pin 50 carried by the latter is brought into contact with the cam element 49 for rotating the latter about the stub-shaft 46. When the free end 58 of the cam element 49 is brought into engagement with the dog 54, the shifting rod 52 is moved in an upward direction whereby the lug 57 is pressed against the lower face of the trip arm 37 for lifting the latter. Upon the lifting of the trip arm 37, the gear 14 is lifted out of engagement with the gear 15 whereby the operation of the cone rack 25 is momentarily stopped. During the period in which the cone rack 25 is stopped, the full bobbin may be removed from the machine and an empty bobbin substituted therefor and the belt 4 shifted forwardly on the cones 3 and 5 by rotating the hand wheel shaft 22 by means of the hand wheel 23.

It is to be noted that the operative connection for the stop motion mechanism is entirely independent of the cone rack 25, being operated directly from the contact shaft 9. Due to the independent operation of the stop motion mechanism with respect to the cone rack 25, the tension of the latter may be increased or decreased as conditions may require without in any way affecting the operation of the stop motion mechanism, thereby insuring the operation of the stop motion mechanism after a predetermined number of layers of roving have been wound on the bobbin, irrespective of any variation in the tension of the cone rack.

It is thought that the many advantages of a stop motion mechanism in accordance with this invention will be readily apparent, and although the preferred embodiment of the invention is as illustrated and described, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to, so long as such changes fall within the scope of the invention as defined in the appended claims.

What we claim is:—

1. In a roving frame for winding roving on a bobbin, a contact shaft, a cone rack, gear-

ing mechanism whereby the cone rack is driven by the contact shaft, a trip arm operatively connected with the gearing mechanism for breaking the latter, and a stop motion mechanism for operating said trip arm when a predetermined number of layers of roving have been wound on the bobbin, said stop motion mechanism operating independently of the cone rack and being driven directly from the contact shaft.

2. In a roving frame for winding roving on a bobbin, a contact shaft, a cone rack, gearing mechanism whereby the cone rack is driven by the contact shaft, a trip arm operatively connected with the gearing mechanism for breaking the latter, and a stop motion mechanism for operating said trip arm when a predetermined number of layers of roving have been wound on the bobbin, said stop motion mechanism operating independently of the cone rack and including a rotatable shaft operated by said contact shaft, a gearing mechanism operated by said rotatable shaft, a vertically shiftable rod operated by said last named gearing mechanism, and means carried by the rod for engagement with said trip arm.

3. In a roving frame for winding roving on a bobbin, a contact shaft, a cone rack, gearing mechanism whereby the cone rack is driven by the contact shaft, a trip arm operatively connected with the gearing mechanism for breaking the latter, and a stop motion mechanism for operating said trip arm when a predetermined number of layers of roving have been wound on the bobbin, said stop motion mechanism operating independently of the cone rack and including a rotatable gear, means operatively connecting said gear with the contact shaft, an element projecting from one face of said gear, and means operated by said element for engagement with said trip arm.

4. In a roving frame for winding roving on a bobbin, a contact shaft, a cone rack, gearing mechanism whereby the cone rack is driven by the contact shaft, a trip arm operatively connected with the gearing mechanism for breaking the latter, and a stop motion mechanism for operating said trip arm when a predetermined number of layers of roving have been wound on the bobbin, said stop motion mechanism operating independently of the cone rack and including a stub shaft, a gear rotatably mounted on the stub shaft, means operatively connecting said gear with the contact shaft, a pin projecting from one face of said gear, a cam element rotatably mounted on said stub shaft for engagement by said pin, and means operated by said cam element for engagement with said trip arm.

5. In a roving frame for winding roving on a bobbin, a contact shaft, a cone rack, gearing mechanism whereby the cone rack is driven by the contact shaft, a trip arm operatively connected with the gearing mechanism for breaking the latter, and a stop motion mechanism for operating said trip arm when a predetermined number of layers of roving have been wound on the bobbin, said stop motion mechanism operating independently of the cone rack and including a stub shaft, a gear rotatably mounted on the stub shaft, means operatively connecting said gear with the contact shaft, a pin projecting from one face of said gear, a cam element rotatably mounted on the stub shaft for engagement by said pin, a vertically shiftable rod, a dog carried by the rod for engagement by said cam element, and a lug carried by said road for engagement with the lower face of said trip arm.

In testimony whereof, we affix our signatures hereto.

EDWARD W. NETHERLAND.
JOHN R. WALKER.