June 9, 1936. C. MORTON 2,043,765

SPINNING FRAME

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Fig. 1.

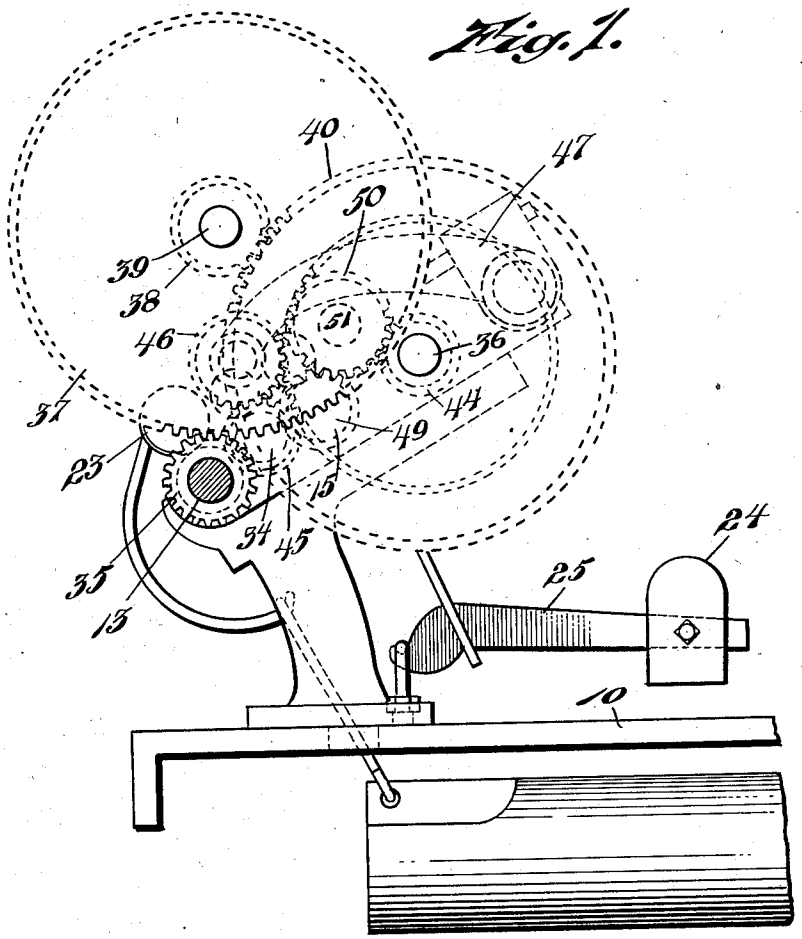
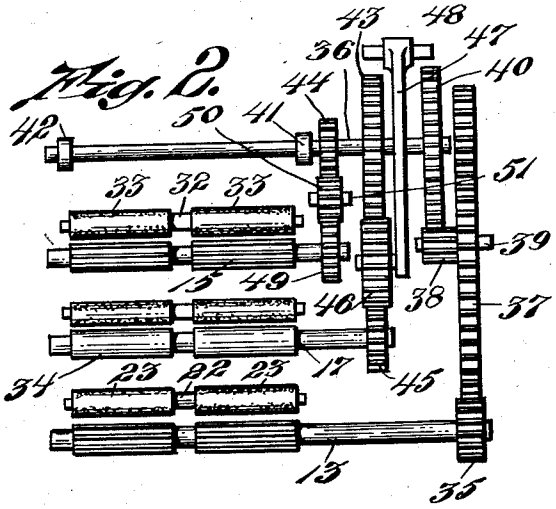


Fig. 2.



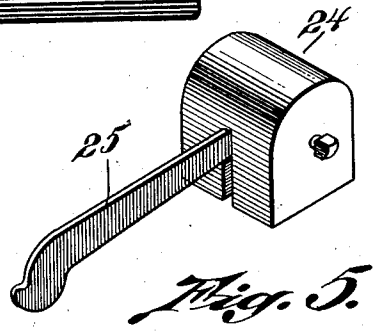


Fig. 5.

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Fig. 3.

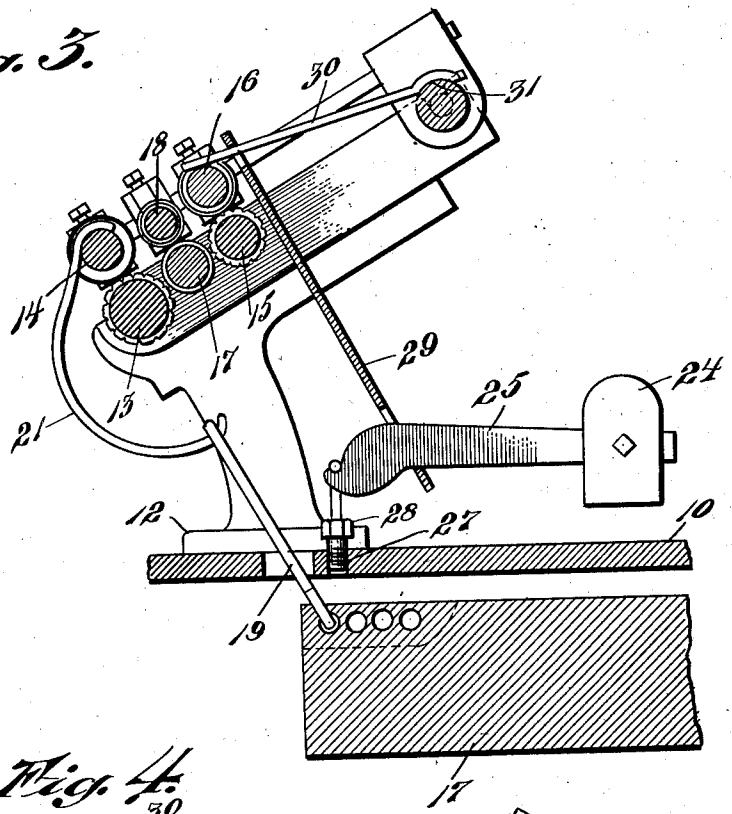
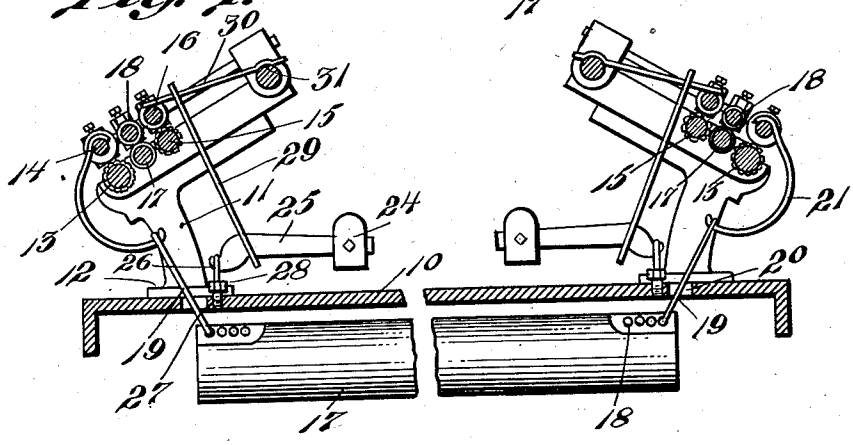


Fig. 4.



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Patented June 9, 1936

2,043,765

UNITED STATES PATENT OFFICE

2,043,765

SPINNING FRAME

Charles Morton, Pawtucket, R. I.

Application March 24, 1932, Serial No. 600,868

2 Claims. (Cl. 19—130)

This invention relates to a spinning frame and has for one of its objects to provide a drive for nip rolls of a relatively small size, so that they may be run close together with their surfaces just clear of each other.

Another object of this invention is the provision of a drive for such small closely related rolls in which all of the gears for the drive may be arranged at one end of the machine.

Another object of this invention is the provision of a pair of carrier rolls in which the weight of the upper carrier roll may be increased without causing cockle or beaded yarn.

Another object of the invention is the provision of a pair of carrier rolls in which the upper roll may be heavier without gripping the yarn, the same being so surfaced as to permit the yarn to slip to prevent cockling or beading of the yarn.

Another object of the invention is the provision of a weight for applying pressure to the back roll of the machine, which weight is arranged above the breast beam of the spinning frame and in the same vertical plane with the weight below the frame for the upper front rolls of the spinning units.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is an end view at the head end of the machine of one of the spinning units showing the gearing arrangement for driving the rolls.

Fig. 2 is a diagrammatic view illustrating the arrangement in plan of the gears for driving the rolls.

Fig. 3 is a sectional view through one of the spinning units showing the weighting means and also the smooth surfaced carrier roll between the fluted back and front rolls.

Fig. 4 is a view similar to Fig. 3 on a small scale showing both of the units of the spinning frame.

Fig. 5 is a perspective view of the weight for applying pressure to each back roll of the pairs of rolls of each of the spinning units.

Long draft spinning is desired and to accomplish this result I position the pairs of nip rolls with their points of nip close together. In order to do this the rolls must be made small. The size, however, of the rolls is limited as they must possess sufficient strength for transmitting the strains to which they are subjected, and in order to drive these small rolls in close relation I have arranged various drives as shown in my Patents Nos. 1,619,985 dated March 8, 1927, 1,619,986 dated March 8, 1927 and 1,783,301 dated December 2, 1930, and I have now found that by the use of a stud shaft, where a three line system is desired, or by using one of the back rolls, where a four line system is used, I may arrange gears to drive the back and intermediate rolls all from a single end of the machine so that their surfaces may run just clear of each other whereby long draft may be had. The lower carrier roll which is located between two pairs of nip rolls has a hard smooth surface, such as found on finished steel, whereby I may use a larger top intermediate roll **20** that its weight or mass is increased, and thus it will not cease to rotate upon being engaged by imperfections in the yarn, as this smooth surface permits the yarn to slip rather than grip the yarn and cause cockling or beading. Also, where a close arrangement of the rolls is desired the manner of weighting the rolls is of importance, and I have weighted the back roll independently from the front roll permitting free access to the intermediate roll, which weight is above the breast beam and back of the spinning units and not between the points of nip of the draft rolls; and the following is a detailed description of the present embodiment of this invention illustrating the preferred means by which these advantageous results may be accomplished.

With reference to the drawings, **10** designates the breast beam of a spinning machine upon which there is supported two individual spinning units each having a standard **11** with a pedestal **12** resting on the breast beam. Each of these units consists of a pair of front rolls **13** and **14**, a pair of back rolls **15** and **16** and a pair of intermediate rolls **17** and **18** therebetween.

The front rolls of each spinning unit are weighted by means of a common weight **17a** extending beneath the breast beam **10** and provided with openings **18a** into any one of which the link **19** may be connected. This link extends through the opening **20** in the breast beam and is connected by means of a curved link **21** to the reduced portion **22** between the working surfaces **23** of the upper roll of the front rolls for applying pressure thereto.

The back rolls of each unit are weighted by means of individual weights **24**, each adjustably mounted on the end of a lever **25** which is fulcrumed by extending beneath a U shaped strap **26** adjustably mounted by means of a threaded portion **27** and nut **28** in the breast beam of the

machine. This lever is connected by means of a link 29 to the lever 30 fulcrumed as at 31 for applying pressure on the upper roll of the pair of back rolls by engagement with the narrow portion 32 between the working surface 33 thereof.

Each of the rolls 13 and 15 of the front and back pairs of rolls are fluted in the usual manner and between the lower rolls of these pairs is located the steel intermediate roll 17 provided with a smooth surface 34, which surface runs just clear of both of the back rolls 13 and 15. By reason of this smooth surface, I am enabled to use a heavier top roll 18 for this pair of carrier rolls than would otherwise be permitted as this smooth surface 34 permits the fibers to slip as they pass therethrough to prevent cockling or beading of the yarn, which would otherwise occur, and by the use of this heavier upper roll the same will continue its rotation and be uninterrupted by the imperfections or lumps in the yarn which would otherwise disturb its continuous even rotation were it lighter in weight and thus yarn of higher quality may be produced.

The drive of these rolls in their closely related relation will be best explained by a reference to Figures 1 and 2. The front roll 13 is provided with a gear 35 which drives a stud shaft 36 through gears 37 and 38, turning on shaft 39, and gear 40 mounted on the shaft 36. The shaft 36 is mounted in bearings 41 and 42. I have referred to this shaft 36 as a stud shaft, although it is shown in the diagrammatic view of Figure 2 as extending a substantial length; this is merely for the purpose of acquiring a substantial bearing. In the diagrammatic three line system illustrated, this length performs no function beyond the portion necessary for suitable mounting of the gears; however, it is fully contemplated that the stud shaft 36 may have roll surfaces provided thereon and function as a roll, such as a breaker draft roll as disclosed in my Patent No. 1,783,301 dated December 2, 1930 or where a four line system of draft is had.

On the shaft 36 I provide two separate gears 43 and 44. From the gear 43, I drive the lower intermediate roll 17 which has mounted thereon a gear 45 and is connected to the gear 43 by an intermediate gear 46 rotatably mounted on the swingable arm 47 which is pivoted as at 48 to be moved to and from engaging position as desired for the removal or manipulation of the intermediate rolls. The arm 47 is suitably curved as shown in Figure 1 to avoid any obstructing parts. The back roll 15 is provided with a gear 49 which is connected to the separate gear 44 on this shaft 36 by means of an intermediate gear 50 mounted on a shaft 51 for rotation in the desired position.

By this arrangement of driving an additional roll or shaft such as 36 and then driving forward individually to the different rolls I am unlimited in the size of the transmission gears which I may use and thus I may acquire the desired speeds and arrangements of the rolls so that their surfaces may run one just clear of the other.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a long draft spinning frame, successive front, intermediate and back pairs of roll members with their ends arranged in echelon relation, a short stub shaft located in sequence with said members adjacent the back roll members, means for driving the front roll members, means for driving the stub shaft at the head end of the frame from the front roll members at their end portions, means for driving the back roll member directly from the stub shaft and independent means for driving the intermediate roll member directly from the stub shaft, said drives being each in a different plane at said echelon arranged ends of said roll members, whereby a compact relation of the roll members may be had, said back and front roll members being weighted to nip the work.

2. In a long draft spinning frame, successive front, intermediate and back pairs of roll members with their ends arranged in echelon relation, a short stub shaft located in sequence with said members and in back of said back roll member, means for driving the front roll members, gear means for driving the stub shaft at the head end of the frame from the front roll members at their end portions, gear means for driving the back roll member directly from the stub shaft and independent gear means for driving the intermediate roll members directly from the stub shaft, said gear drives being each in a different plane at said echelon arranged ends of said roll members, whereby a compact relation of the roll members may be had, and said back and front roll members being weighted to nip the work.

CHARLES MORTON.