July 2, 1940. P. LITTY 2,206,360

DRAWING MECHANISM FOR SPINNING APPARATUS

Filed May 14, 1938

FIG. 1.

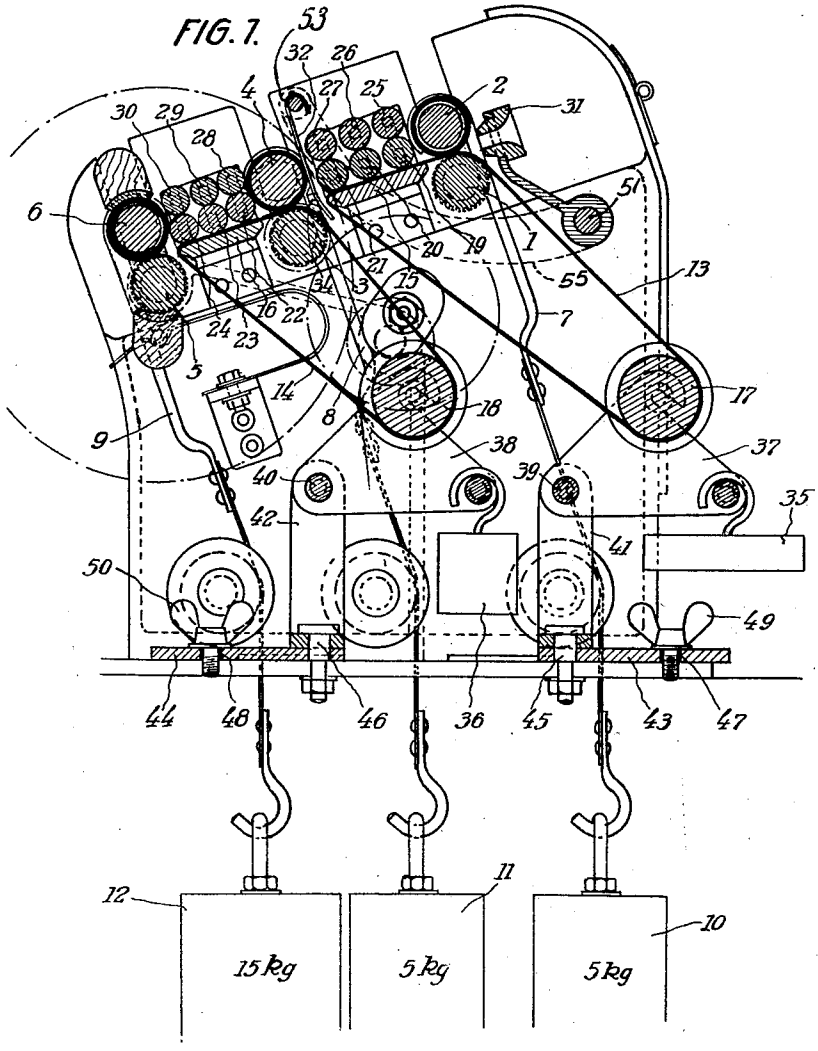


FIG. 2.

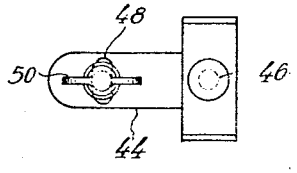
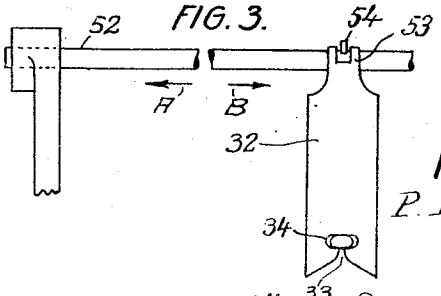


FIG. 3.



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DRAWING MECHANISM FOR SPINNING APPARATUS

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In Germany May 20, 1937

6 Claims. (Cl. 19—131)

The invention relates to a drawing-machine for spinning-frames, especially for the production of a testing thread for ascertaining the spinning capabilities of a fibrous material and the strength of a thread spun from it. In this case, it is of special importance to rapidly draw in succession a fibrous sliver from a short, a medium sized, and a long fibre, without any adjusting of the nipper (gripping) and drawing rollers. The invention is adapted to be used in connection with the apparatus disclosed in my application Ser. No. 147,970, of June 12, 1937.

In the known devices, a drawing-frame with adjustable drawing rollers is used for further working of the sliver produced with the small carding engine. With such a drawing-frame, the correct distance between the individual drawing rollers has to be ascertained in a rather troublesome manner according to the respective length of fibre of the fibrous material to be tested.

This not only delays ascertaining the spinning capabilities of the fibrous material and the strength of the thread spun from it, but the cost of the whole device is raised considerably, owing to the complicated construction of such a drawing-frame with adjustable drawing rollers.

As a fibrous material contains, apart from the principal length of fibre, also shorter fibres, the guiding of the fibre in a nipper drawing-frame is not as good as in a drawing-machine.

The invention obviates these disadvantages inasmuch as for the further working of a sliver, produced with a carding machine, for example with the small carding engine disclosed in my application Ser. No. 147,970, of June 12, 1937, a drawing-machine is provided, in which are arranged one or more little straps and which has heavily loaded pairs of cylinders with fixed spacing at a distance considerably greater than the longest fibres, and several loaded pressing rollers (preferably with rolling loads) of smaller diameter between the pairs of cylinders above the small strap or straps, or above a strap table substantially filling the space between the pairs of cylinders.

This invention is illustrated by way of example in the accompanying drawing, in which—

Fig. 1 is a sectional view of the apparatus in the running direction of the sliver of fibrous material,

Fig. 2 is a top view of an individual part,

Fig. 3 is an elevational view of an individual part.

In the drawing, 1—2, 3—4, 5—6 are pairs of cylinders serving as nipper rollers, which are loaded rather heavily by means of the known hooks 7, 8, 9, provided with weights 10, 11, 12 of 5 and 15 kgs. As the drawing-machine serves for drawing a single thread, this is a very heavy load. The cylinders 1, 3, and 5, are suitably fluted rollers. The cylinders 1 and 3 at the same time serve to guide the little straps 13, 14, which are conducted over strap tables 15, 16 and which are kept under tension by loaded stretching rollers 17, 18.

The strap tables substantially extend along the whole space between the pairs of nipper rollers. It is important to provide loaded pressing or carrier rollers 19, 20, 21, 22, 23, and 24 of smaller diameter on the straps and above the strap tables, the pressure exerted by these rollers upon the fibrous sliver being increased by rollers 25 to 30 arranged above.

The carrier rollers are suitably of smaller diameter, as shown in the drawing, arranged at very short distances at the side of each other so that several drawing places are provided in the space between the pairs of nipper rollers. In this way, not only the long fibres, but also the short fibres of a certain fibrous material are securely held, guided, and drawn, thus enabling fibres of for example fifteen to forty millimeters length to be drawn at the same time in a favourable manner and then to be spun. The front pair of rollers 24, 30 and 21, 27 respectively serves for holding the short fibres, the centre pair 23, 29 and 20, 26 respectively for holding the fibres of medium length, and the rear pair 22, 28 and 19, 25 respectively for holding the long fibres, without having to lift any pair of rollers. This results in the heavy load of the front pair of nipper rollers. The fibrous sliver is fed to the drawing-machine through an inlet funnel 31, and a condenser 32 is arranged between the drawing panels. This condenser has a conical slot 33 which, in upward direction, leads into a suitaly oval opening 34 growing narrower in the running direction of the sliver.

The weights 35, 36 of the stretching rollers 17 and 18 engage in cages 37, 38 rotatable about axles 39, 40. These axles are parts of bows 41, 42, each of which is fixed to an adjusting plate 43, 44. These adjusting plates are oscillatable about pivots 45, 46. The plate 43 may be secured in an adjusted position by means of a thumb screw 49 having a threaded portion extending through a slot 47. The plate 44 is provided with a similar slot 48 and a thumb screw 50.

With this device it is possible to adjust the

little straps, which sometimes get widened at both sides, to ensure that each strap runs flat over its table without sliding in a lateral direction. The inlet funnel 31 is suitably fixed to a rod 51, and the condenser 32 is fixed to a rod 52. The condenser 32 is loosely hung by means of a hook 53 having an opening for receiving a pin 54 on the rod 52. By means of any suitable device, the rod 51 is given a reciprocating movement and is connected by one or two bows 55 with the rod 52 to confer to the latter the reciprocating movement in the directions shown by arrows A and B in Fig. 3.

The apparatus provides two drawing zones, one between the rollers 1, 2 and 3, 4 and the other between the rollers 3, 4 and 5, 6.

The rollers 1 and 2, the rollers 19, 20, 21, 25, 26, 27 and the strap 13 have a speed corresponding substantially to the circumferential speed of the roller 1. This circumferential speed is ensured by the special load of the lower rollers which is applied by means of the loaded rollers 25, 26 and 27. The same operation applies to the strap 14 and the rollers cooperating therewith. The speed of the rollers 3 and 4 however, is greater than the speed of the rollers 1 and 2 and preferably about one and one-half times greater. The speed of the rollers 5 and 6 is greater than the speed of the rollers 3 and 4 according to the draft and from six to ten times greater than the speed of the rollers 3 and 4, or about eight to fifteen times greater than the speed of the rollers 1 and 2.

The small rollers 19 to 30 are not positively driven but rotated as a result of the frictional engagement with the straps 13 and 14.

What I claim is:

1. A drawing mechanism for spinning apparatus for producing a testing thread to ascertain the spinning capacity and thread strength qualities of a fibrous material comprising, at least two pairs of nipper rollers spaced with respect to each other and each pair of nipper rollers being loaded with approximately 5 kilograms, said pairs of nipper rollers being arranged at a distance with respect to each other which is greater than the longest fibers to be worked, a further pair of nipper rollers loaded with approximately 15 kilograms and spaced with respect to one pair of the first mentioned nipper rollers at a distance greater than the longest fibers to be worked, a fixed rest between the first mentioned pairs of nipper rollers, a strap movable over the fixed rest, a second fixed rest between the second mentioned pair of nipper rollers and one pair of the first mentioned pairs of nipper rollers, a strap movable over the second fixed rest, several rollers each having a diameter smaller than that of the nipper rollers arranged above the straps, and an inlet funnel for collecting an incoming sliver of the fibrous material.

2. A drawing mechanism for spinning apparatus for producing a testing thread to ascertain the spinning capacity and thread strength qualities of a fibrous material comprising, at least two pairs of nipper rollers spaced with respect to each other and each pair of nipper rollers being loaded with approximately 5 kilograms, said pairs of nipper rollers being arranged at a distance with respect to each other which is greater than the longest fibers to be worked, a further pair of nipper rollers loaded with approximately 15 kilograms and spaced with respect to one pair of the first mentioned nipper rollers at a distance greater than the longest fibers to be worked, a fixed rest between the first mentioned pairs of nipper rollers, a strap movable over the fixed rest, a second fixed rest between the second mentioned pair of nipper rollers and one pair of the first mentioned pairs of nipper rollers, a strap movable over the second fixed rest, several guiding rollers each having a diameter smaller than that of the nipper rollers arranged above the straps, an inlet funnel for collecting an incoming sliver of the fibrous material, and a weighted roller arranged above each guiding roller.

3. A drawing mechanism for spinning apparatus for producing a testing thread to ascertain the spinning capacity and thread strength qualities of a fibrous material comprising, at least two pairs of nipper rollers spaced with respect to each other and each pair of nipper rollers being loaded with approximately 5 kilograms, said pairs of nipper rollers being arranged at a distance with respect to each other which is greater than the longest fibers to be worked, a further pair of nipper rollers loaded with approximately 15 kilograms and spaced with respect to one pair of the first mentioned nipper rollers at a distance greater than the longest fibers to be worked, a fixed rest between the first mentioned pairs of nipper rollers, a strap movable over the fixed rest, a second fixed rest between the second mentioned pair of nipper rollers and one pair of the first mentioned pairs of nipper rollers, a strap movable over the second fixed rest, several guiding rollers each having a diameter smaller than that of the nipper rollers arranged above the straps, an inlet funnel for collecting an incoming sliver of the fibrous material, a weighted roller arranged above each guiding roller, and a condenser supported for limited movement between one of the pairs of nipper rollers.

4. A drawing machine for spinning frames for the production of a testing thread comprising, pairs of nipper rollers arranged in a spaced relation with respect to each other and at a distance greater than the longest fibers to be worked, unequal weights loading the pairs of nipper rollers, a fixed rest between each of the pairs of nipper rollers, straps movable over the fixed rests, a roller for tensioning each strap, a cage for each tensioning roller, a bow member pivotally supporting each cage of the tensioning roller, weights of different size loading the cages of the tensioning rollers, guiding rollers each having a smaller diameter than that of the nipper rollers, a loaded roller above each of the guiding rollers, an inlet funnel for collecting an incoming sliver of fibrous material, and a condenser loosely suspended adjacent a pair of the nipper rollers.

5. A drawing machine for spinning frames for the production of a testing thread comprising, pairs of nipper rollers arranged in a spaced relation with respect to each other and at a distance greater than the longest fibers to be worked, unequal weights loading the pairs of nipper rollers, a fixed rest between each of the pairs of nipper rollers, straps movable over the fixed rests, a roller for tensioning each strap, a cage for each tensioning roller, a bow member pivotally supporting each cage of the tensioning roller, weights of different size loading the cages of the tensioning rollers, carrier rollers each having a smaller diameter than that of the nipper rollers, a loaded roller above each of the carrier rollers, an inlet funnel for collecting an incoming sliver of fibrous material, a condenser loosely suspended adjacent a pair of the nipper rollers, a rod for supporting

the condenser and a rod supporting the funnel, and means connecting said rods.

6. A drawing machine for spinning frames for the production of a testing thread comprising, pairs of nipper rollers arranged in a spaced relation with respect to each other and at a distance greater than the longest fibers to be worked, unequal weights loading the pairs of nipper rollers, a fixed rest between each of the pairs of nipper rollers, straps movable over the fixed rests, a roller for tensioning each strap, a cage for each tensioning roller, a bow member pivotally supporting each cage of the tensioning roller, weights of different size loading the cages of the tensioning rollers, carrier rollers each having a smaller diameter than that of the nipper rollers, a loaded roller above each of the carrier rollers, an inlet funnel for collecting an incoming sliver of fibrous material, a condenser loosely suspended adjacent a pair of the nipper rollers, a rod supporting the condenser and a rod supporting the funnel, means connecting said rods and said condenser having a conical slot in the lower end thereof ending in an oval shaped opening.

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