July 6, 1954 K. STRÄSSLER 2,682,998

SPOOL ASSEMBLY AND OPERATING MECHANISM THEREFOR IN TEXTILE MACHINES

Filed June 4, 1951

Fig. 1.

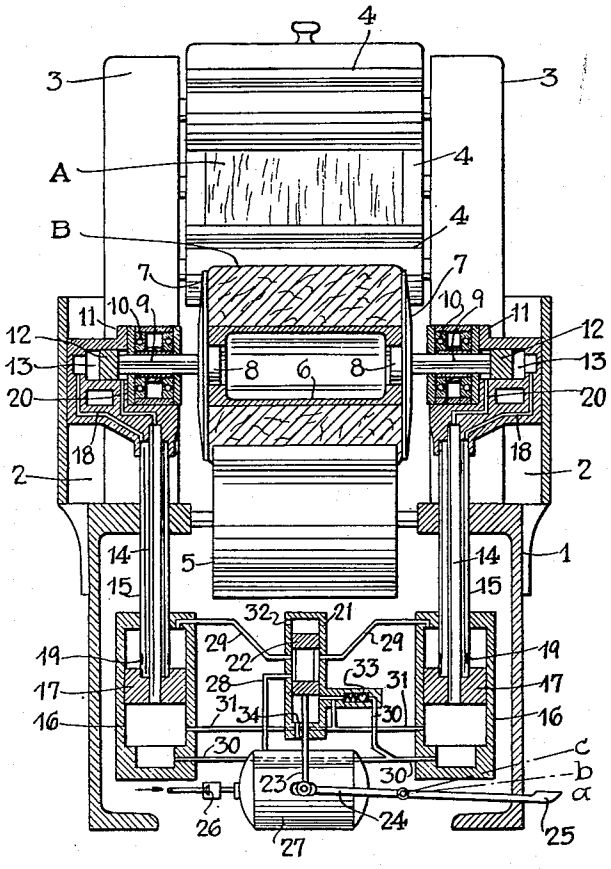


Fig. 2.

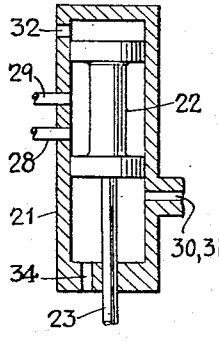


Fig. 3.

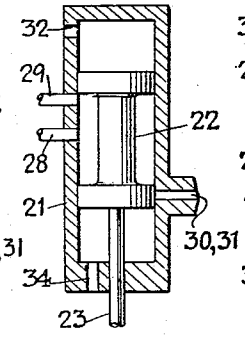
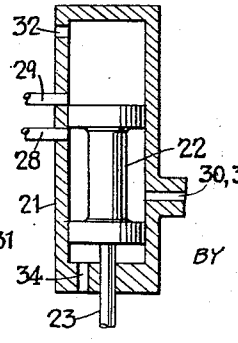


Fig. 4.



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SPOOL ASSEMBLY AND OPERATING MECHANISM THEREFOR IN TEXTILE MACHINES

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Claims priority, application Switzerland June 9, 1950

8 Claims. (Cl. 242—55.1)

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The present invention relates to a spool or bobbin assembly and operating mechanism therefor in textile machines, more particularly to an arrangement for fixing the lap cylinder or tube between rotatably supported end plates and for lifting and lowering the spool assembly, particularly in scutchers and sliver lap machines.

In conventional machines of this type, the end plates of the lap bobbin are usually pressed against a sleeve by means of nuts at the ends of a rod extending through the plates and sleeve. Lifting of the finished lap on its bobbin and removal of the rod is done by hand. This takes time and is too difficult and tiring particularly for female operators.

It is an object of the present invention to provide means for automatically fixing the end plates of a lap bobbin to and removing same from the lap tube.

A further object of the invention resides in the provision of a lap bobbin comprising a central tube member and bobbin discs having projecting central portions adapted to be individually inserted in the ends of the tube and means connected with the discs for moving same toward and from the tube member. This construction avoids the conventional lap rod and facilitates removal of the finished lap rolls and reduces the time needed therefor.

Another object of the invention resides in the provision of a lap bobbin having a central member, an axial bore at least in the ends thereof, and bobbin discs having pin means axially projecting from one side thereof and adapted to be individually inserted into said bores and pin means axially extending from the other side of said discs and through bearings rotatably supporting the discs, at least one of said last mentioned pin means having a piston connected therewith axially moving in a cylinder and being moved therein by a pressure fluid for applying the respective disc to and removing it from said central member.

An object of the present invention resides in the provision of a mechanism as set forth in the paragraph next above, in which said cylinder is connected with the bearing supporting the pin means carrying the piston which is in said cylinder and in which said bearing is connected with one end of draw rod means whose other end carries a piston movable in a hydraulic or pneumatic cylinder for lifting and lowering the lap bobbin, said draw rod means having conduits therein for conducting pressure fluid to and from the first mentioned cylinder, the aforementioned

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conduits communicating preferably with both cylinders for interdependent operation of the pistons therein and parts connected to the pistons. In a preferred embodiment of the invention, the draw rod means consist of two concentric tubes individually connected for fluid flow with the chambers in said cylinders on opposite sides of the pistons.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims, and shown in the drawing which, by way of illustration, shows what I now consider to be preferred embodiments of my invention.

In the drawing:

Fig. 1 is a diagrammatic front view, partly in section, of a cotton lap machine equipped according to the invention.

Figs. 2 to 4 are diagrammatic, large scale, sectional views of a detail of the machine according to Fig. 1 in different operating positions.

Referring more particularly to the drawing, numeral 1 designates a frame portion of a lap machine with upright guides 2 and bearing supports 3 mounted on the frame, supports 3 carrying bearings for calender rollers 4 which compress the sliver mass A. Frame 1 supports two lap rollers 5, which are in the same plane and of which only the forward one is visible in Fig. 1. The lap roll B rests in the conventional manner on the rollers 5 while being rolled up. The lap is formed on a cylinder or lap roll sleeve 6 clamped between end discs or plates 7 and having bores at its ends individually receiving pin means or centering heads 8 extending axially from the inside of the discs 7. Shafts 9 extend from the outside of the discs and are borne in ball bearings 10 individually disposed in draw heads or bearing assemblies 11. The outer ends of shafts 9 are formed as pistons 12 which are axially movable in power cylinders formed by bores 13 in the heads 11. The latter are vertically guided by the guides 2 which also receive the reaction of the pressure at which the discs 7 are forced to the cylinder 6. The heads 11 are connected to the upper ends of two steel tubes 14 and 15 disposed one within the other, pistons 17 being connected to the lower ends of the tubes and individually axially movable in pressure cylinders 16. The tubes 14 and 15 are the equivalents of conventional draw bars and serve as posts for the bearings 10 and also as conduits for the fluid operating the mechanism. The bore 13 of the head unit 11 is connected with the upper side of piston 17 by means of a conduit 18 in the

head and the outer tube 15 whose interior communicates through bores 19 with the part of cylinder 16 above piston 17. The inner tube 14 connects bore 13 through a conduit 20 in the head 11 with the part of cylinder 16 below piston 17.

The fluid which operates the pistons 17 in the pressure cylinders 16 and consequently the heads 11 is controlled by a control piston 22 in a control cylinder 21 disposed centrally of frame 1. Piston 22 is connected by rod 23 with a two-arm lever 24 having a pedal 25 at its free end. Operating medium is supplied under pressure from a source, not shown, through a check valve 26 to a pressure tank 27 and therefrom to the control cylinder 21 through conduit 28.

By actuating pedal 25, the piston 22 is moved to the upper position shown in Figs. 1 and 2 and corresponding to position *a* of the pedal, or the piston 22 is moved to the middle position shown shown in Fig. 3 and corresponding to position *b* of the pedal, or the piston 22 is moved to its low position shown in Fig. 4 and corresponding to position *c* of the pedal. When the pedal 25 is in position *a*, piston 22 connects the tank 27 through conduit 28 and conduits 29 with the upper parts of the pressure cylinders 16. These parts are connected with the spaces in cylinder bores 13 outside of pistons 12. When lever 24 is in middle position, control piston 22 blocks conduits 30 and 31, as shown in Fig. 3, and prevents escape of pressure fluid from cylinders 16 below pistons 17, maintaining conduits 28, 29 open. When piston 22 is in its lower position (Fig. 4), conduits 29 communicate through an opening 32 in the top of cylinder 21 with the atmosphere, whereas tank 27 is connected through conduit 28 and conduits 30 and 31 with the spaces in pressure cylinders 16 below pistons 17 wherefrom the fluid pressure is also conducted through conduits 14 and 20 to the spaces in the cylinder bores 13 inside of pistons 12.

For starting the machine, pedal 25 is moved to position *c* so that pressure fluid enters the spaces below pistons 17 through conduits 28, 30, 31 and the pistons are moved upwards lifting the heads 11. The fluid above pistons 17 is relieved through conduits 29 and opening 32 in cylinder 21. The fluid pressure in the lower parts of cylinder 17 is conducted through the inner tubes 14 and conduits 20 to the inside of piston 12, moving discs 7 outward so that an empty roll or cylinder 6 can be inserted and stuck on the projection 8 of one of the discs. Thereupon the pedal 25 is moved to position *b*, causing piston 22 to block conduits 30 and 31 and to connect the upper parts of cylinders 16 through conduits 28 and 29 with the pressure tank 27. Since no fluid can flow from the lower parts of cylinders 16, pistons 17 and heads 11 remain in their upper positions. The pressure now acting on the upper side of pistons 17 is transferred through the outer tubes 15 and conduits 18 to the outside of pistons 12, so that the discs 7 are moved towards each other clamping cylinders 6 therebetween.

Thereupon pedal 25 is brought into normal operating position *a*, moving control piston 22 to its upper position which is shown in Figs. 1 and 2. The fluid continues to act on the upper sides of pistons 17, whereas the fluid below said pistons flows through conduits 30 and 31 and is relieved through opening 34 in the bottom of cylinder 21. This causes quick downward movement of the pistons 17 and the heads connected therewith until pistons 17 block conduits 31. The fluid remaining below pistons 17 must now be forced through conduits 30, which are connected with

the bottom ends of cylinders 16, and through a valve 33 provided in a lateral protuberance on the cylinder body 21 into the cylinder 21 which it leaves through opening 34. Valve 33 throttles the flow of the fluid considerably so that it can leave the bottom parts of cylinders 16 only very slowly, whereby the pressure below pistons 17 is raised and the downward movement of the pistons 17 and heads 11 is stopped gently. The machine is ready for normal operation as soon as the lap roll 6 comes to rest on the rollers 5. The rotation axis of the lap bobbin rises gradually as the lap is formed, thereby lifting the discs 7 and heads 11 and pulling pistons 17 upward. This causes compression of the fluid above pistons 17 and in tank 27 and increases the pressure at which the lap is pressed against the rollers 5. For removal of the finished lap roll and insertion of a new cylinder 6, pedal 25 is moved to position *c*.

Since all movements are effected by the pressure fluid and only the pedal 25 must be actuated, the work to be done by the operators is reduced considerably and female personnel can be employed. Since there is no conventional lap rod, no time is wasted in screwing it on and off. Compressed air or another gas, as well as liquids, can be used as operating fluid.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. In a textile machine, a bobbin comprising a cylinder having a bore at each end, two end plates, each plate having pin means on its inside adapted to be received in one of said bores, each end plate having a shaft means on its outside, a bearing for each shaft means, at least one of said shaft means being axially movable for connecting and disconnecting said end plates to and from said cylinder, a power cylinder connected with the bearing for the axially movable shaft means, a piston connected with the latter and received in said power cylinder, said bearings and bobbin supported thereby being movable transversely to the rotation axis of the bobbin, draw bar means connected with each bearing, and conduits in the draw bar means of the bearing with which said power cylinder is connected, for supplying and relieving an operating medium to and from said power cylinder for axially moving said piston.

2. In a textile machine according to claim 1, at least the draw bar means of the bearing with which said power cylinder is connected consisting of two tubes placed within each other, each tube constituting one of said conduits.

3. In a textile machine, a bobbin comprising a cylinder having a bore at each end, two end plates, each end plate having a pin means on its inside adapted to be received in one of said bores, each end plate having a shaft means on its outside, a bearing for each shaft means, a post for each bearing, said posts being unmovable in the direction of the rotation axis of said bobbin, at least one of said shaft means being axially movable in its bearing for connecting and disconnecting said end plates to and from said cylinder, and hydraulic means contained in the post supporting the bearing for the axially movable shaft means for moving the latter and its plate to and from said cylinder.

4. In a textile machine according to claim 3, a piston connected with said axially movable shaft means, a cylinder for said piston, said cylinder being disposed in the post for the bearing of said shaft means, and conduit means disposed in said post and connected with said cylinder for supplying and relieving an operating fluid to move said piston with its shaft means and end plate to and from said bobbin cylinder.

5. A lap winding apparatus comprising two stationary uprights, a lap roll sleeve disposed between said uprights, a disc axially removably connected wtih each end of said sleeve, a shaft connected with each of said discs coaxially of said sleeve, said shafts individually extending toward said uprights, two bearing units individually axially movably receiving said shafts, said units being slidable along said uprights and spaced from said sleeve for affording axial movement of said discs to engage and disengage said sleeve, pressure fluid actuated means contained in said units for axially moving said shafts, and means restrainedly yieldably supporting said bearing units and affording restrained yielding movement of the latter in accordance with the diameter variations of the lap roll.

6. A lap winding apparatus comprising two stationary uprights, a lap roll sleeve disposed between said uprights, a disc axially removably connected with each end of said sleeve, a shaft connected with each of said discs coaxially of said sleeve, said shafts individually extending toward said uprights, two bearing units individually axially movably receiving said shafts, said units being slidable along said uprights and spaced from said sleeve for affording axial movement of said discs to engage and disengage said sleeve, and pressure fluid responsive means connected with said units for axially moving said shafts in said units and for sliding the latter along said uprights.

7. A lap winding apparatus comprising two stationary uprights, a lap roll sleeve disposed between said uprights, a disc axially removably connected with each end of said sleeve, a shaft connected with each of said discs coaxially of said sleeve, said shafts individually extending toward said uprights, two bearing units individually axially movably receiving one of said shafts, said units being slidable along said uprights and spaced from said sleeve for affording axial movement of said discs to engage and disengage said sleeve, first pressure fluid responsive means connected with said units for axially moving the shafts in said units, second pressure fluid responsive means, support means for said units connected with and actuated by said second responsive means for sliding said units along said uprights, said support means forming conduits interconnecting said responsive means for interdependent operation of the latter.

8. A lap winding apparatus comprising a frame, two bearing assemblies slidable on said frame, a lap roll sleeve interposed between said assemblies, two disc members, a shaft extending from one side of each of said disc members concentrically thereof and axially slidable into one of said bearing assemblies, a centering head extending from the other side of each of said disc members and adapted to be inserted into said sleeve for supporting the latter, a piston connected with each of said shafts, a cylinder forming part of each of said bearing assemblies and individually receiving one of said pistons, draw bars individually having ends individually connected with said assemblies, pistons individually connected with the other ends of said bars, cylinders individually receiving said last mentioned pistons, a controlled pressure fluid system connected with said last mentioned cylinders, and conduit means in said draw bars connecting said last mentioned cylinders with the cylinders forming part of said assemblies for interdependent actuation of said last mentioned pistons and of the pistons connected with said shafts.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,066,377	Wean et al.	Jan. 5, 1937
2,109,936	Tice	Mar. 1, 1938
2,194,078	Simonds	Mar. 19, 1940
2,346,948	Shackelford et al.	Apr. 18, 1944
2,450,608	Page	Oct. 5, 1948

FOREIGN PATENTS

Number	Country	Date
438,640	Great Britain	Nov. 20, 1935