

Feb. 14, 1939.

J. P. LAIRD

2,147,204

SPINDLE FOR SPINNING MACHINES

Filed March 11, 1938

2 Sheets-Sheet 1

Fig. 1.

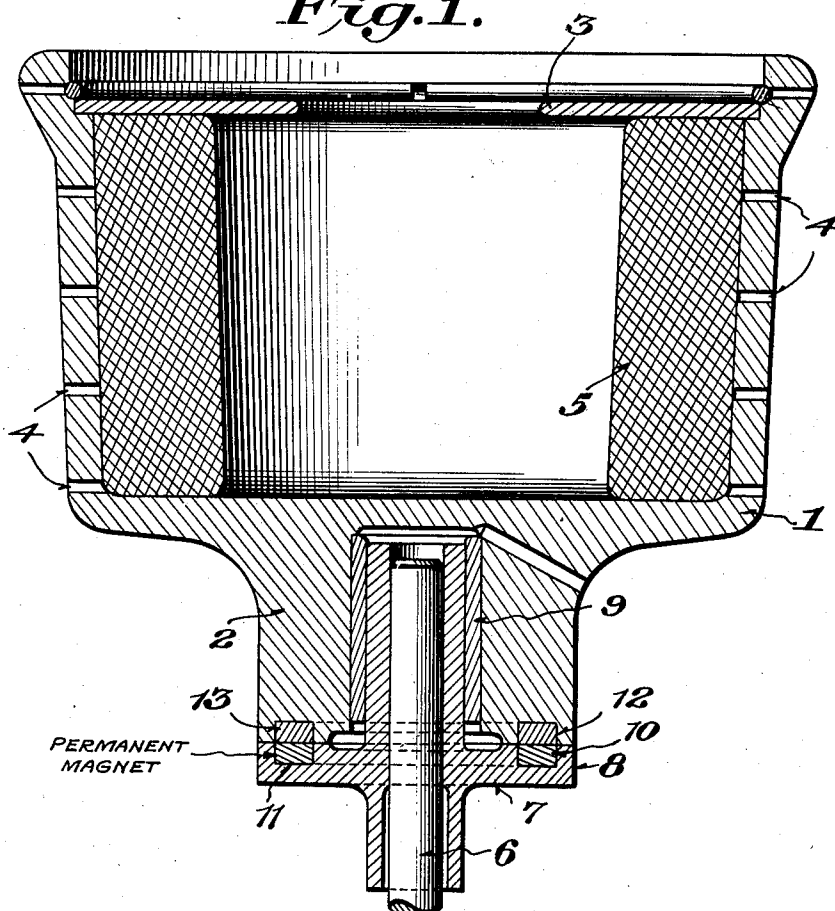


Fig. 2.

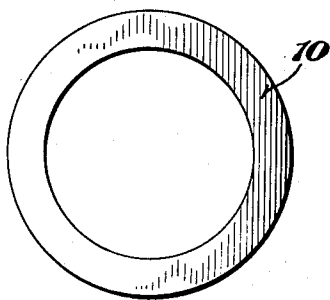


Fig. 3.

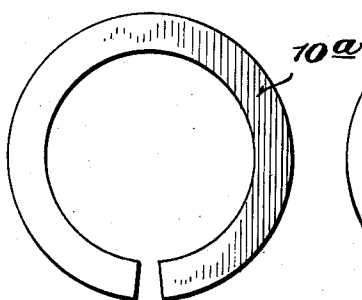
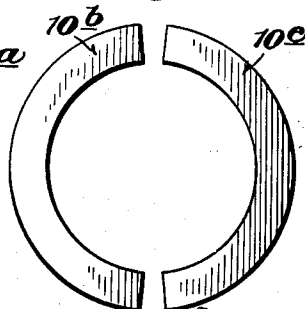


Fig. 4.



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Fig. 5.

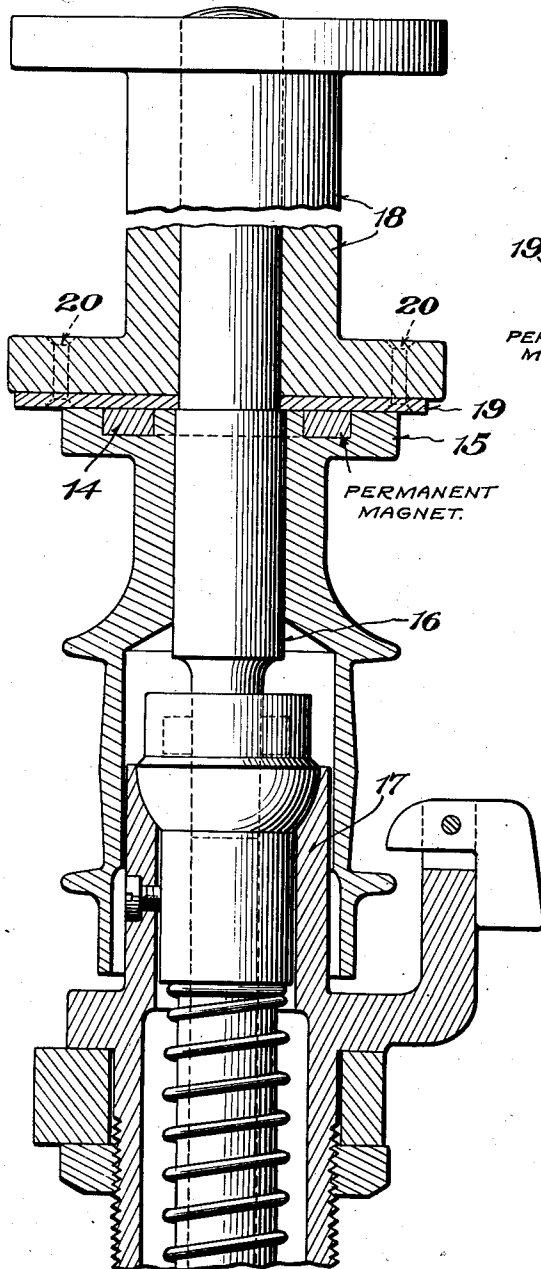
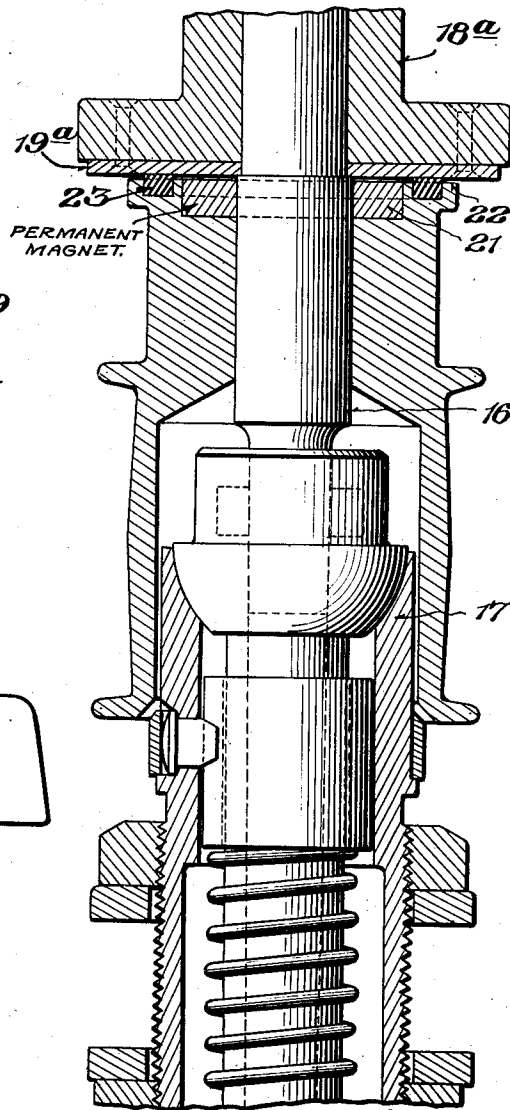


Fig. 6.



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UNITED STATES PATENT OFFICE

2,147,204

SPINDLE FOR SPINNING MACHINES

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Application March 11, 1938, Serial No. 195,390

10 Claims. (Cl. 64—30)

My invention relates to new and useful im-
provements in mechanisms for spinning rayon,
and has for an object to so arrange the spin pot
and spindle that on the starting of the spindle,
the pot will come into rotation in a smooth and
even manner to thus prevent any jerking which
would result in broken threads.

The invention also contemplates a similar ar-
rangement for rayon spinning where a spindle
and bobbin are used, these being the two well-
known types of mechanisms employed in the
spinning of rayon.

Another principal object of the invention is
to arrange a permanent magnet in the spindle,
which cooperates with a steel plate secured in
the bottom surface of the pot, if the pot is to
be used with the spindle, or a steel plate secured
to the bottom of the bobbin, where the bobbin
is used with a spindle.

A further object of the invention is to provide
a magnetic clutch arrangement on the spindle,
so that either a bobbin or a pot may be utilized,
providing these pots or spindles have a cooper-
ating plate on their under surface, which will be
located adjacent the permanent magnet on the
spindle.

Still another object of the invention is to
provide a magnetic clutch for the spindle wherein
the magnet may be in contact with a steel plate
or metal plate on the bottom of the spindle or
pot or the permanent magnet may be located a
slight distance below the plate that is located
on the under surface of the spin pot or bobbin.

Still another object of the invention is to pro-
vide a magnetic clutch wherein the permanent
magnet may be made up of a plurality of sec-
tions, a split ring, or a solid ring, which, in turn,
will cooperate with a plate on the bottom of
the bobbin or spindle.

Still another object of the invention is to pro-
vide a magnetic clutch utilizing a permanent
magnet on the spindle, so that on the starting of
the spindle, the bobbin or spin pot may slip
slightly with regard to the spindle, but after
having once started to rotate, it will continue
to rotate with the spindle.

Still another object of the invention is to
provide a magnetic clutch wherein magnets of
different strength may be utilized, which will be
strong enough to overcome the period of inertia
and will cause the bobbin or spin pot to rotate
with the spindle, but, at the same time, will pre-
vent a sudden jerking at the start of the rotation
of the spindle and its bobbin or spin pot.

With these and other objects in view, the in-

vention consists in certain new and novel fea-
tures and combination of parts, as will be here-
inafter more fully explained and pointed out in
the claims.

Referring now to the drawings showing a pre-
ferred embodiment,

Fig. 1 is a vertical sectional view of a spin
pot together with a fragmentary portion of a
spindle and in which two parts is located the
magnetic clutch;

Fig. 2 is a fragmentary detail of one form of
circular ring magnet;

Fig. 3 is a view of a split ring magnet;

Fig. 4 is a similar view of a magnet made up
of a plurality of sections;

Fig. 5 is a vertical sectional view showing a
spindle and its bolster, the magnetic clutch, and
a bobbin in position; and

Fig. 6 is a similar view but showing the magnet
spaced slightly below the plate on the under
surface of the bobbin and showing a rubber or
fiber seat for the bobbin.

Referring now more specifically to the several
views, and for the moment to Fig. 1, there is
shown a conventional Bakelite spin pot 1 with
its hub 2, cover 3, the peripheral openings 4,
and the rayon cake or nest 5 within the pot.
There are also shown a fragmentary portion of a
spindle 6, which is motor-driven, the spindle
seat 7, and its outstanding flange 8. There is
further shown a bushing 9 within the hub 2 of
the pot, which loosely fits over the upper end
of the spindle 6.

Located within the rim 8 of the seat 7 is a
permanent magnet in the form of a ring 10,
which fits within an annular recess 11 formed
on the upper surface of the rim 8 of the seat 7.
The under surface of the hub of the spin pot 2
is also provided with an annular recess 12 in
which is permanently embedded a ferrous metal
ring 13, which is located directly over the afore-
mentioned permanent magnetic ring 13.

In Figs 3 and 4, there are shown slightly dif-
ferent forms of permanent magnets, the one
being in the form of a split ring 10^a, while in
Fig. 4 this magnetic ring or permanent magnet
is made up of two sections 10^b and 10^c. In all
instances, the object is to be attained is to locate
a permanent magnet in the spindle seat and a
ferrous or other metal ring in the hub of the
spin pot, so that on the start of rotation of the
spindle, there will be a small amount of slippage
between the spin pot and the seat on the rotat-
ing spindle. Thus, there will be no sudden jar
to the pot as it starts its rotation, while, on the

other hand, after the pot starts in motion, it will continue to do so and rotate with the spindle without further slippage. This is highly desirable in the spinning of rayon to prevent an undue strain on the thread, which would cause it to break on the starting of the spin pot.

These spin pots rotate at 6,000 R. P. M., and by providing a magnet of sufficient strength, the period of inertia can be overcome without any undue shock to the spin pot and, at the same time, will prevent any slippage during the continued rotation of the spindle and the pot.

In the bobbin spinning of rayon and as shown in Figs. 5 and 6, the same arrangement and advantages are carried out by installing a permanent magnet 14 in the top of the wall 15, which is mounted on the whorl 16. In Fig. 5, I have shown the spindle together with the bolster 17 and as this latter forms no part of the present invention, no further description is thought necessary.

It will be understood that these spindles are belt-driven and often travel at a rate of 10,000 R. P. M., and unless some provision is made for overcoming the initial jar on the starting of the spindle and the rotation of the bobbin, there is great likelihood of the thread being broken.

In the present instance, therefore, I have shown a bobbin 18, while located on its under surface is a metal plate 19, which may be fastened, as at 20, this plate being made of any desired ferrous metal, so that it, in turn, will be acted on by the permanent magnet 14 embedded in the whorl, which magnet may also be of the form shown in Figs. 2, 3, or 4. Thus, when this belt-driven spindle is started, there will be a certain amount of slippage with respect to the bobbin, but after the bobbin once starts, it will be prevented from further slippage and will rotate with the same speed as the spindle.

A slightly different form is shown in Fig. 6, wherein there is embedded a permanent magnet 21 which is slightly below the top surface 22 of the whorl, and there will further be noticed an annular insert 23, which may be of rubber, fiber, or other desired material, to form a seat on which rests the bobbin 18^a, this bobbin, in turn, having the metal plate 19^a secured to its under surface. It will be seen that there is a slight gap between the magnet 21 and the plate 19^a, which will increase the pull. In all events, however, the magnetic force must not be so great as to prevent any slippage, but, on the other hand, the desideratum is to use a magnet of such strength as will permit a slight slippage when overcoming the period of inertia of the bobbin.

I am aware that it is old in the art to provide magnetic clutches in various mechanisms, but I am not aware of the embodiment of magnets of desirable strength used on bobbins and spin pots together with their spindles wherein the magnets are of such strength as to allow a desired amount of slippage but will prevent further slippage after the period of inertia is overcome.

Many slight changes are possible in the construction hereinbefore set forth without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A magnetic clutch for a spindle, said spindle provided with a seat near its top, a removable thread-holding means, said seat having a permanent magnet therein, and the thread-holding means having a magnetic metal plate on the bot-

tom thereof cooperating with the magnet, the strength of the magnet being such that the thread-holding means may slip with respect to the spindle on the starting of the rotation of the spindle.

2. A magnetic clutch for spindles used in textile spinning machines including a seat secured to the upper end of the spindle, said seat provided with a permanent magnet therein, a removable thread-holding means provided with a cooperable magnetic metal plate to be attracted by said magnet, and the strength of the magnet being such that a slippage may occur between the spindle and the thread-holding means at the start of rotation of the spindle but not thereafter.

3. A magnetic clutch for a spindle used in spinning including a seat secured to the upper end of the spindle, a removable thread-receiving means, a permanent ring magnet located in the seat, a cooperating magnetic metal plate on the thread-receiving means, and the strength of the magnet being such that slippage may occur between the spindle seat and the thread-receiving means during the moment that the inertia of the thread-receiving means is overcome.

4. A magnetic clutch for a spindle having a seat near its top for supporting thread-receiving means, said magnetic clutch including a magnet located within the seat, a thread-receiving means having a magnetic plate for functioning with said magnet, the said plate being in contact with said magnet, and the strength of the magnetic clutch being such that slippage may occur between the thread-receiving means and the spindle during the starting of the spindle but thereafter preventing slippage during the continuous rotation of the spindle.

5. A magnetic clutch for a spindle used in spinning, the said spindle having a seat near its upper end, a permanent magnet located in said seat, a spin pot loosely mounted on the spindle and having a magnetic metal plate on its bottom cooperating with said magnet, and the strength of the magnet being such as to permit slippage on the starting of the rotation of the spindle and preventing rotation after the two parts are in motion.

6. A magnetic clutch for a spindle and spin pot, a part of the magnetic clutch being located in the spindle and a part being located within the spin pot, and the strength of the magnetic clutch being such as to permit the spin pot to start its rotation in a smooth and even manner and prevent slippage after the inertia of the spin pot has been overcome.

7. A magnetic clutch for the bobbin type spinning machine, the spindle having a seat formed near its upper end, a permanent magnet forming part of the clutch secured in the upper portion of the seat, a bobbin having a magnetic metal plate in its bobbin for cooperating with said magnet, and the strength of the magnet being such that slippage may occur on the starting of the spindle but not thereafter.

8. A magnetic clutch for a spindle having a whorl, thereon, the clutch consisting of a magnet and a metal plate; the magnet being located in said whorl, the bobbin having the metal plate on its under surface cooperating with the aforesaid magnet, and the strength of the magnet being such as to permit slippage on the start of rotation of the spindle but not thereafter.

9. A magnetic clutch for a spindle the latter having a seat near its top for supporting thread-receiving means, a magnet forming a part of the

the clutch within the seat, a thread-receiving means having a magnetic plate forming the remaining part of the clutch, the said plate being out of contact with said magnet, and the strength of the magnet being such that slippage may occur between the thread-receiving means and the spindle during the starting of the spindle but thereafter preventing slippage during the continuous rotation of the spindle.

10 A magnetic clutch for a spindle for textile spinning machines, a seat secured near the upper

end of said spindle, a permanent magnet on said seat, a support on the seat extending in a plane slightly above the upper plane of the magnet, a removable thread-holding means provided with a metal plate on its under surface to be acted on by said magnet and form the remaining part of the clutch, and the strength of the magnet being such as to allow slippage between the spindle and the thread-holding means at the start of rotation of the spindle but not thereafter.

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