

March 13, 1951

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2,544,766

ANTICREEP WARP-LIFTING ROLLER IN CIRCULAR WEAVING LOOMS

Filed Jan. 26, 1949

2 Sheets-Sheet 1

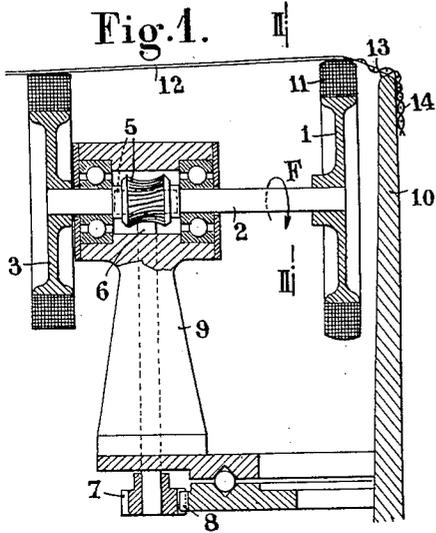


Fig. 2.

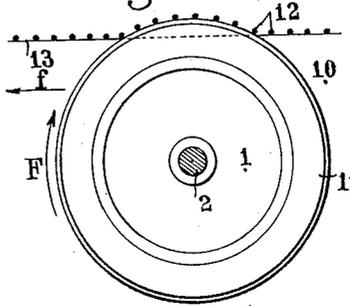


Fig. 5.

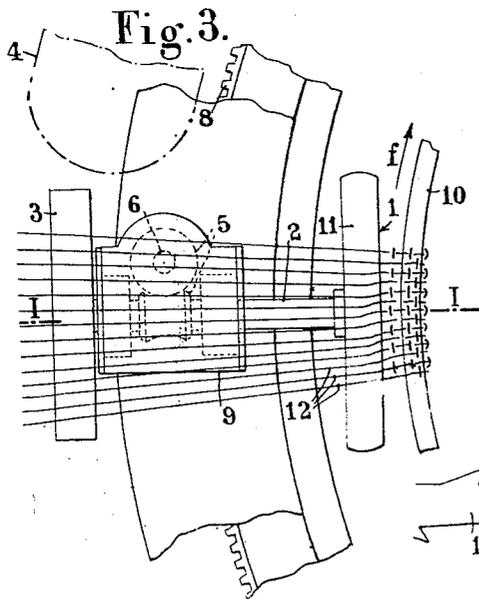
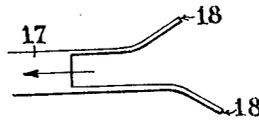


Fig. 6.

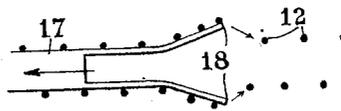
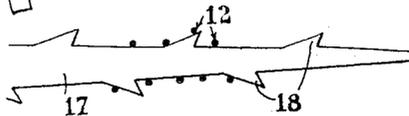


Fig. 7.



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Fig. 8.

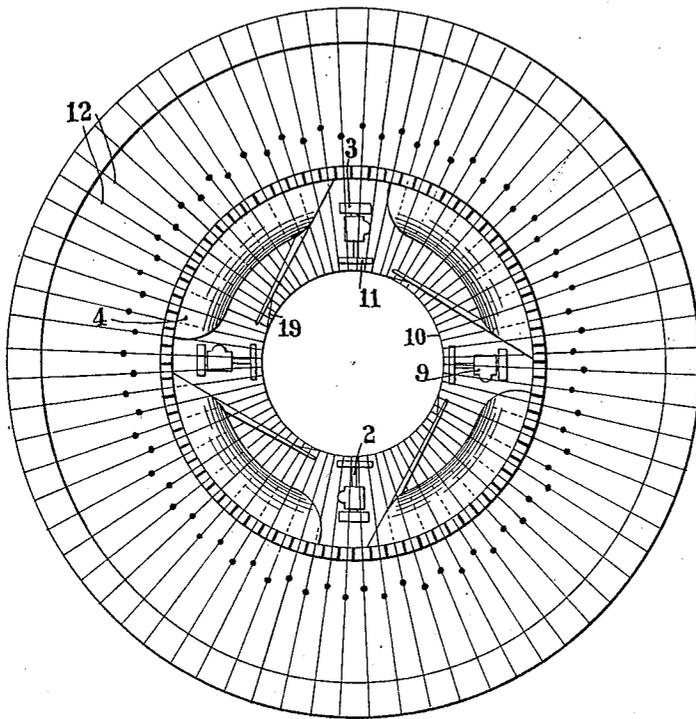
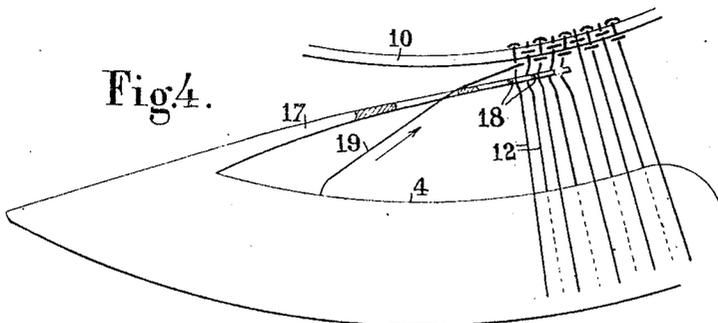


Fig. 4.



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UNITED STATES PATENT OFFICE

2,544,766

ANTICREEP WARP-LIFTING ROLLER IN CIRCULAR WEAVING LOOMS

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Application January 26, 1949, Serial No. 72,792
In France January 28, 1948

6 Claims. (Cl. 139—13)

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The present invention concerns circular weav-
ing looms and aims more particularly at check-
ing the tendency of the fabric to creep circum-
ferentially in the direction of rotation of the
shuttles.

The present invention consists in a roller pro-
vided at the rear of each shuttle, rotated about
the loom well at a speed equal to that of the
shuttle and of which the rim which is made of a
thread-retaining material will slightly lift the
warp thread sheets as it moves past the same and
rotated at a peripheral speed higher than its
speed of revolution about the well, with the result
that each warp thread will be replaced on the
well edge without any vibration at a point just a
little behind the one it occupied when lifted
therefrom by the roller.

The action of the roller according to the in-
vention offsets the lateral displacement to which
the warp threads are subjected in the direction of
rotation of the shuttles due to the friction exerted
thereupon by the latter and to the pull conse-
quent to the insertion of the weft-thread. In
view of the action exerted upon the warp threads
by the roller according to the invention said roller
is called a "warp-lifting roller."

The advantage with the roller according to the
invention is that the warp threads that are
caught by the periphery thereof are shifted
backwards (considering the direction of rotation
of the shuttles) to a point behind the one occu-
pied by each particular thread before it was
crossed by the roller without any vibration being
imparted to said thread; effectively, the unde-
sired effect of such vibrations would be to im-
mediately cancel the lifting action of the roller
and to restore the warp threads to the positions
occupied by the same on the edge of the well
prior to the passage of the roller according to the
invention. A further effect of such vibrations
would be to curl the warp threads.

According to a further feature of the invention,
where the shuttle motion comprises a driving
roller, the rotational movement of the lifting
roller according to the invention is derived from
that of said driving roller. More particularly, the
driving roller and the lifting roller may be keyed
on one and the same shaft. Such an arrange-
ment considerably facilitates the mounting of the
lifting roller which in this manner is rotated
about the well at the same speed as the driving
roller and consequently as the shuttle while it is
rotated about their common shaft at the same
speed as the driving roller; the ratio between
the diameters of either roller may be so chosen

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that the peripheral speed imparted to the lifting
roller will tend to shift the warp threads con-
trawise to the direction of displacement of the
said roller about the well.

The roller according to the invention may be
used in combination with weft-thread combining
the beating and warp-thread distributing devices.

More particularly, the lifting roller may be
located at the rear of a wheel provided at its
periphery with spikes designed to press the weft
thread into the shed.

According to a particular feature of the in-
vention the lifting action exerted upon the warp
threads by the roller according to the invention
is combined with a scraping of the warp threads
effected by the shuttle, of which the weft thread
inserting arm is provided with suitable spikes or
scrapers.

A particular embodiment of the invention will
be described hereinafter, reference being had to
the appended drawing which relates to a circular
weaving loom in which the shuttle is propelled by
a driving roller and in which the lifting roller
and the driving roller are keyed on one and the
same shaft.

Figure 1 is a radial section on line I—I in Fig. 3.

Figure 2 is a vertical section of the lifting roller
taken on line II—II in Fig. 1.

Figure 3 is a plan view.

Figure 4 is a plan view showing a warp thread
scraping device.

Figures 5, 6 and 7 illustrate various embodi-
ments of the spikes or scrapers for the combing
or scraping of the warp threads.

Figure 8 is a plan view of a weaving loom
equipped according to the invention.

The lifting roller 1 is keyed on one and the
same shaft 2 as the driving roller 3 by which the
shuttle 4 is propelled.

The shaft 2 is driven through the medium of a
gear train 5, a shaft 6 and a pinion 7 which
meshes with a fixed spur ring 8. As the housing
9 in which the rollers 1 and 3, the gear train 5,
the shaft 6 and the pinion 7 are mounted is re-
volvolved about the well 10 of the loom with respect
to the fixed spur ring 8, the pinion 7 is rotated
and its movement is transmitted to the shaft 2
and to the rollers 1 and 3.

The rim 11 of the roller 1 is made of rubber.

The topmost portion of the roller 1 lifts the
sheets of warp threads 12 close to the well 10.

The peripheral speed of the roller 1 is slightly
higher than the speed at which the same is re-
volvolved about the well, with the result that the
warp threads that are lifted by the roller 1 are

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laid down again upon the edge 13 of the well 10 at points thereon which (considering the direction in which the shuttles are run) lie behind those at which they were standing before they were lifted by the roller. The aforescribed action of the roller 1 counteracts the tendency of the fabric 14 to creep round, i. e. the tendency of the warp threads to become wound in helices on the inside of the well 10, as they would otherwise due to their being shifted laterally every time the shuttles move across and due also to the slight pull exerted by the weft thread in the direction of movement of the shuttles.

The arrow F in Fig. 2 shows the direction of the peripheral speed of the roller 1 while the arrow f denotes the direction of rotation of the shuttles, i. e. the direction in which the roller 1 is revolved about the well 10.

The weft thread laying arm 17 provided on the shuttle carries spikes 18 which are effective to scrape the warp threads to sort them out and to uniformize the distance between each of them and the next one.

Figures 5, 6 and 7 illustrate various embodiments of the spikes or scrapers 18.

Consequently, the scraping of the warp threads effected by the spikes or scrapers 18 is combined with the lifting action of the roller 1.

The spikes or scrapers 18 scrape the threads 12 and sort them out while the roller lifts the threads resting on the edge 13 of the well in the order of succession in which they stand just before the passage of the said roller.

What we claim is:

1. In a circular weaving loom having a well and comprising at least one shuttle by means of which a weft thread is laid between the ways thread sheets close to the top of the well, a warp-lifting roller positioned at the rear of each shuttle and revolved about the loom well at a speed equal to that of the shuttle the rim of said roller being formed from a thread-retaining material and being adapted to slightly lift the warp threads as it moves past the same, said roller be-

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ing rotated at a peripheral speed greater than the speed of revolution of the roller about the well whereby each warp thread will be replaced on the well edge without vibration at a point just a little behind the one it occupied when lifted therefrom by the roller.

2. In a circular weaving loom according to claim 1, wherein the warp-lifting roller is rubber-rimmed.

3. In a circular weaving loom according to claim 1, a propelling roller for each shuttle and means for simultaneously driving each warp-lifting roller and the related propelling roller.

4. In a circular weaving loom according to claim 1, in which each shuttle is provided with a propelling roller mounted upon a shaft, and a warp thread lifting roller is keyed on the shaft of the related shuttle-propelling roller.

5. In a circular weaving loom according to claim 1, the provision of a warp thread scraping device adapted to sort out the warp threads and to keep them equally spaced ahead of each warp thread lifting roller.

6. In a circular loom according to claim 1, the combination with the warp thread lifting roller of scraping means adapted to sort the threads to keep them equally spaced without any change in their order of succession while they are lifted clear of the top edge of the well, the said scraping means comprising a weft-laying arm rigid with the shuttle and having a plurality of spikes provided thereon.

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