Oct. 10, 1933. E. HOCHHEIMER 1,929,689

FIXING MACHINE

Filed Feb. 26, 1931 2 Sheets-Sheet 1

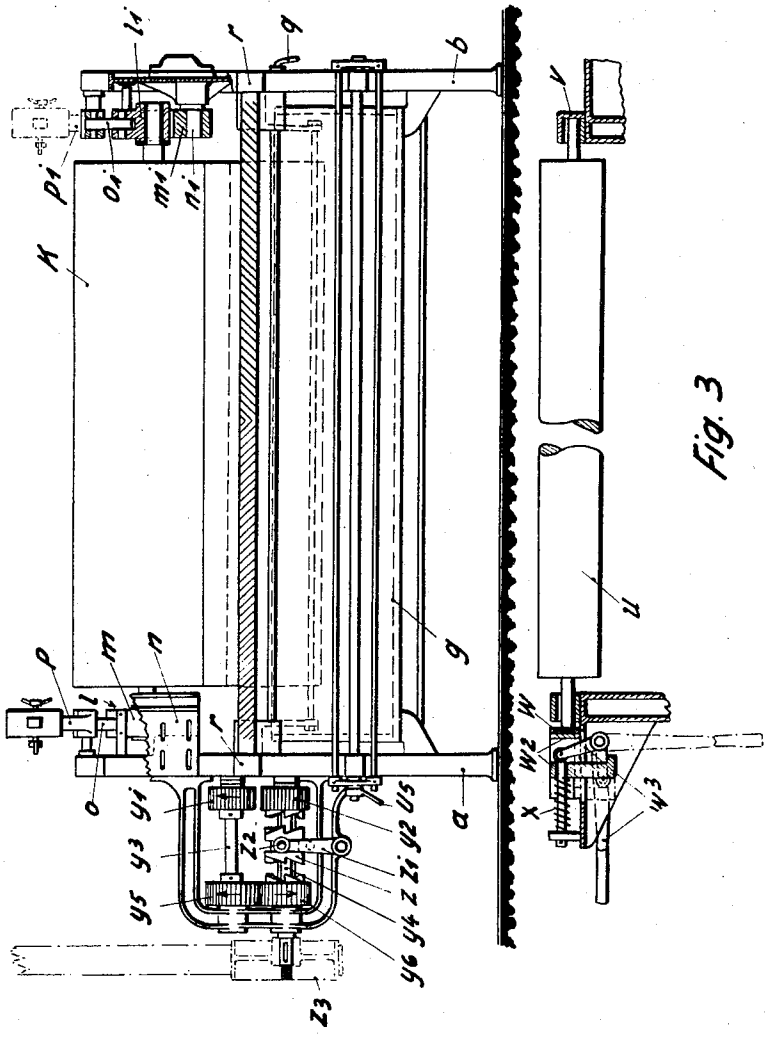

Fig. 1

Fig. 3

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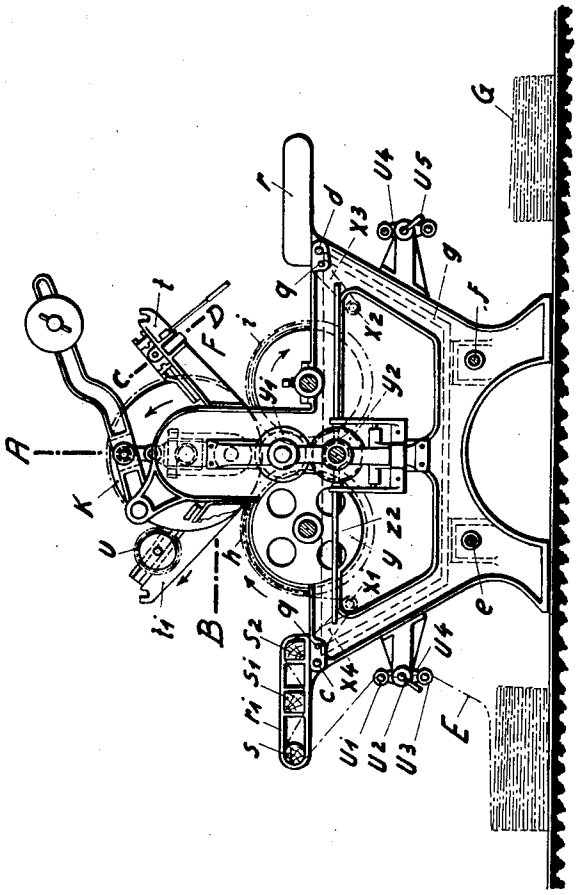
Fig. 2



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UNITED STATES PATENT OFFICE

1,929,689

FIXING MACHINE

Ernst Hochheimer, Aachen, Germany

Application February 26, 1931, Serial No. 518,587, and in Germany March 8, 1930

6 Claims. (Cl. 8—19)

This invention relates to a machine known under the name of boiling or fixing machine for the wet treatment of fabric in a trough or bath, especially for de-sizing, smoothing, fixing, for producing gloss and also for carrying out other prepared dressing operations.

The known machines of this type are provided with a pair of squeezing cylinders or drums, the lower of which runs partly submerged in a vat containing hot water, and it is equipped with forward and reverse movement, in order to be able to wind and unwind the fabric, whereas the upper cylinder is adapted to be raised and lowered and is loaded by weighted levers, so that it presses on the winding cylinder wound more or less with the web of fabric, that is varying in diameter, and is rotated thereby. A third, so called ductor or take-off cylinder is journaled slidably on an inclined plane in such a manner that it always bears against the upper pressure cylinder and is rotated thereby. It serves for winding the length of fabric to be treated during the unwinding from the lower cylinder so that it can then be subjected to further dressing measures.

By means of these known boiling machines a fresh length of fabric can not be treated before the previously treated length has been unwound completely from the lower cylinder, that is, only a comparatively small output can be obtained.

Contrary thereto, the machine according to the invention allows the simultaneous treatment of two lengths of fabric and consequently the attaining of double the output, in that during the unwinding of one length of fabric, a second length of fabric is already being wound.

The invention consists substantially in that the upper pressure cylinder is arranged, not only so that it can be raised and lowered, but also can yield towards both sides, over two winding cylinders, arranged in known manner side by side and partly submerged in the liquid bath. Thus it bears on both winding cylinders and can at the same time adapt itself automatically to their actual diameter. The upper pressure cylinder is further of such weight or loaded by the weighted levers in such a manner that it transmits the rotating movement of the one driven winding cylinder to the other loosely rotatable winding cylinder, thereby squeezing out the wet web of fabric, and moreover bearing arrangements are provided on both sides of the upper pressure cylinder for the loose bearings of the ductor cylinder on the upper pressure cylinder in known manner so that the ductor cylinder can be journaled as desired on the one or the other side of the upper pressure cylinder.

Owing to this complete arrangement according to the invention a web of fabric can be wound on one of the two winding cylinders and at the same time a second web of fabric, which has been previously wound on the other winding cylinder, can be unwound therefrom. The winding cylinder, which is actually driven, rotates the pressure cylinder, pressing tightly against it, in the opposite direction of rotation. The pressure cylinder in turn rotates the second winding cylinder in the same direction as that of the first winding cylinder. According to whether the fabric to be wound on the ductor cylinder is unwound from the one or the other winding cylinder, the ductor cylinder must be journaled either on the front side or on the rear side of the pressure cylinder.

The web of fabric unwinding alternately from the one or the other winding cylinder is preferably guided at the top around the pressure cylinder to the ductor cylinder or take-off roller, journaled on the opposite side. This method of working presents the advantage that the web of fabric coming out of the bath is supported and guided, that is held stretched by the pressure cylinder serving as bearing surface along its entire path from the winding cylinder to the ductor cylinder. In the known simple boiling machine, in which the fabric web is conducted from the winding cylinder directly around the ductor cylinder, and is not supported on such a bearing surface, a continual pulling on the edges of the hot web of fabric coming from the bath is required. This constitutes a very disagreeable and tiring work, in order to retain the width of the web of fabric, that is, to prevent the formation of creases and for obtaining the uniform winding of the web on the ductor cylinder. This work is saved by the particular arrangement of the bearing devices for the ductor cylinder on the machine frame and by the above mentioned method of employing the machine.

An embodiment of the invention is illustrated by way of example in the accompanying drawings in which:—

Fig. 1 shows the machine in elevation, partly in section on line A—B of Fig. 2.

Fig. 2 is a side elevation, also partly in section.

Fig. 3 is a cross section on line C—D of Fig. 2 on enlarged scale.

Two lower squeezing cylinders *h* and *i* are rotatably journaled side by side at the same

height in the machine frame
side frames *a* and *b* and stay r
rigidly connecting same. A wo
ing for accommodating the l
this frame, and the cylinders
therein to a certain depth. Th
and *i* are rotated by a geari
hereinafter described, with f
movement in one or other but
rection of rotation. An upper s
k is arranged, movable in a
the two lower cylin-

n the spacing plate
on of the spring *x*,
r mounted thereon.
een the two arms is

ow lever w^3, shown
longer arm of this
whereas its shorter
rds and bears with
ainst the outwardly
g plate support w^2.
w lever w^3 is in the
onsequently pressed,
ch it holds, against
le of the take off
and this cylinder is
ssary for the proper
c. If the shiftable
oved from the take
of taking this off
s, the elbow lever
wise direction until
pressure roller on
e support w^2. The
he position shown
short arm is then
, whereas its long-
vertical direction.
clined position of
w^3, the spring *x*
m still further in
however prevent-
rojection of the
e elbow lever w^3,
are consequently
ngaging position
off cylinder *u* is
it is to be locked
only necessary to
w^3 into the posi-
hat the spring *x* is
ng plate *w* pressed
id face of the take

ching device is pro-
spreading devices
ach of these fabric
of three stay rods
tain distance apart,
and u^3 being rigidly
two two-armed lev-
illatable on the cen-
nted on the machine
position by a clamp-
e end of the stay rod
rods x^1 or x^2 respec-
each side of the ma-
t *g* and each fixed to
tively, which are made
as *r* or r^1 respectively

in the following man-

lower squeezing cylin-
el *y* is keyed meshing
wheels y^1, y^2 arranged
not meshing with each
wheel y^1 being keyed
in the machine frame,
ned wheel y^2 is loosely
ournaled on the machine
el y^2 forming on its outer
itch. A further toothed
he shaft y^3 at a distance
eel y^1 and meshes with a

like-sized toothed wheel y^6 loosely mounted on the shaft y^4 and forming on its inwardly directed face also one half of a claw clutch. A claw clutch sleeve z is shiftably, yet not rotatably mounted on the shaft y^4 between the two toothed wheels y^2 and y^6 and has on its end faces claws, which fit in the claw clutch halves formed on the toothed wheels y^2 and y^6. The claw clutch sleeve z can be coupled as desired either with the toothed wheel y^2 or with the toothed wheel y^6 by means of a fork lever z^1 mounted on the machine frame and having two pins which engage in an external annular groove in the clutch sleeve z and is provided on each side with engaging rods z^2. Thus either the one or the other of these two toothed wheels y^2 and y^6 can be rigidly coupled to the shaft y^4. A belt pulley z^3, shown in mixed lines in Fig. 1, is keyed on the shaft y^4 and serves for driving the machine by means of a belt. If the clutch sleeve z is coupled with the toothed wheel y^6, and if the shaft y^4 is rotated in the direction indicated by the arrow in Fig. 1, the two toothed wheels y^5, y^1 rotate in the opposite direction and consequently cause the toothed wheel y keyed on the axle of the lower squeezing cylinder h, and also the squeezing cylinder h, to rotate in the direction of the arrow shown in Fig. 2. However the upper squeezing cylinder bearing on the lower squeezing cylinders h, i is thereby rotated in the opposite direction, and through the intermediary of the upper squeezing cylinder k the lower squeezing cylinder i is rotated in the same direction as the lower squeezing cylinder h. By coupling the clutch sleeve z with the toothed wheel y^2, the direction of rotation of the shaft y^4 remaining the same, the three squeezing cylinders h, i, and k will be rotated in the opposite direction to the arrows shown on the drawings. The take off cylinder u, bearing on the upper squeezing cylinder k and rotated thereby, is always rotated in the opposite direction to that of the cylinder k.

When the three squeezing cylinders are driven in the directions indicated in the drawings, a piece of fabric E, piled on the left side of the machine as shown in Fig. 2, is first conducted between the adjustable stretching device u^1, u^2, u^3, u^4 and between the spreading device r^1, s, s^1, s^2 arranged above same, then downwards around the stay rod x^1, and then between the lower squeezing cylinder h and the upper squeezing cylinder k, so that it can be wound on the squeezing cylinder h. During this winding operation a second piece of fabric F, which has been previously wound on the lower cylinder rotated in the opposite direction, is at the same time unwound from this cylinder i over the upper squeezing cylinder k and wound on the take off cylinder u mounted for this purpose above the lower cylinder h. During the passage of the piece of fabric F between the cylinders i and k, the liquid present therein is squeezed out at the same time by the upper squeezing cylinder k. The operator can observe from his stand situated on the left side of the machine simultaneously the piece of fabric E winding on the lower cylinder h and also the piece of fabric F coming from the lower cylinder i and winding on the take off cylinder u. When the piece of fabric F is completely unwound from the lower cylinder i and wound on the take off cylinder u and if, during this time, the piece of fabric E has completely wound on the lower cylinder h, the operator inserts a second take off cylinder u in the bearing provided above the lower cylinder i, reverses the machine drive and passes the free end of the piece of fabric E from below between the lower cylinder h and the upper cylinder k, over this latter and finally over the just inserted take off cylinder. He then passes from the other side of the machine a fresh piece of fabric G, previously folded at this point, over the stretching device u^1, u^2, u^3, u^4, the spreading device r, s, s^1, s^2, from below over the stay rod x^2 and between the squeezing cylinders i and k, so that this piece of fabric G winds on the lower cylinder i.

In the drawings the machine is shown in the condition, in which the drive of the machine is disengaged by bringing the clutch sleeve z into its central position, a piece of fabric being partly wound on the lower squeezing cylinder h in the direction indicated by the arrow and another piece of fabric being partly unwound from the lower squeezing cylinder i and wound on the take off cylinder u mounted above the squeezing cylinder h.

For the purpose of facilitating the introduction into the machine of the pieces of fabric to be treated, the arms r, r^1, after the pins q have been removed from the machine frame, are swung, together with the stay rods of the spreading devices carried thereby, out of their horizontal working position into a downwardly inclined position, so that at the same time the stay rods x^1, x^2 arranged in the hot water vat g are swung upwards. The pieces of fabric to be treated can then be conducted without much difficulty over the stretching and spreading devices. After the introduction of the pieces of fabric into these devices the spreading devices, and therefore the stay rods x^1, x^2, are swung back into their former horizontal position and locked in this position by inserting the pins q in corresponding bores of the machine frame. The inserted pieces of fabric are then stretched and their tension can be regulated within certain limits by suitably adjusting the stretching devices u^1, u^2, u^3, u^4.

I claim:—

1. A boiling machine for desizing, smoothing, finishing, producing gloss and effecting other preparating dressing operations for the wet treatment of pieces of fabric, comprising in combination a vat adapted to contain hot water, a winding cylinder adapted to be driven in either direction, a second winding cylinder, freely rotatable, arranged at the side of said driven winding cylinder, both of said winding cylinders partially extending into said vat, an upper pressure cylinder vertically and laterally arranged above said two winding cylinders adapted to bear continually on said winding cylinders irrespective of their varying diameter, means for weighting said pressure cylinder to transmit the rotary movement from the driven winding cylinder to the loosely rotatable winding cylinder and at the same time to squeeze out the wet fabric, two pairs of inclined bearing supports one on each side of said upper pressure cylinder, relatively shiftable bearings adapted to be alternately inserted in one of said pairs of bearing supports, and a take off cylinder journalled in said bearings adapted to be mounted on the one or the other side of said upper pressure cylinder.

2. A boiling machine as specified in claim 1, comprising in combination with said winding cylinders and said pressure cylinder, two side frames adapted to carry said winding cylinders and said pressure cylinder, two coaxial pins one in each of said side frames directed parallel to the axes of said winding cylinders, two arms provided with slots open at the top oscillatably mounted on said

thereby, adapt-
d from one of

claim 3 where-
prises a fixed
machine and a
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said support
fixed bear-
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wall termi-
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having one
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projection,
ans to re-
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cylinder, bearing
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f roller alternately
ames in accordance
ent of said winding
ing disposed in con-
nder, and resilient
bearing frames to
n a definite position.

HOCHHEIMER.

Oct. 10, 1933. W. F. HIRSCHMAN