June 24, 1930. J. KLEINEWEFERS 1,765,922

CALENDER

Filed June 10, 1929 2 Sheets-Sheet 1

Fig. A.

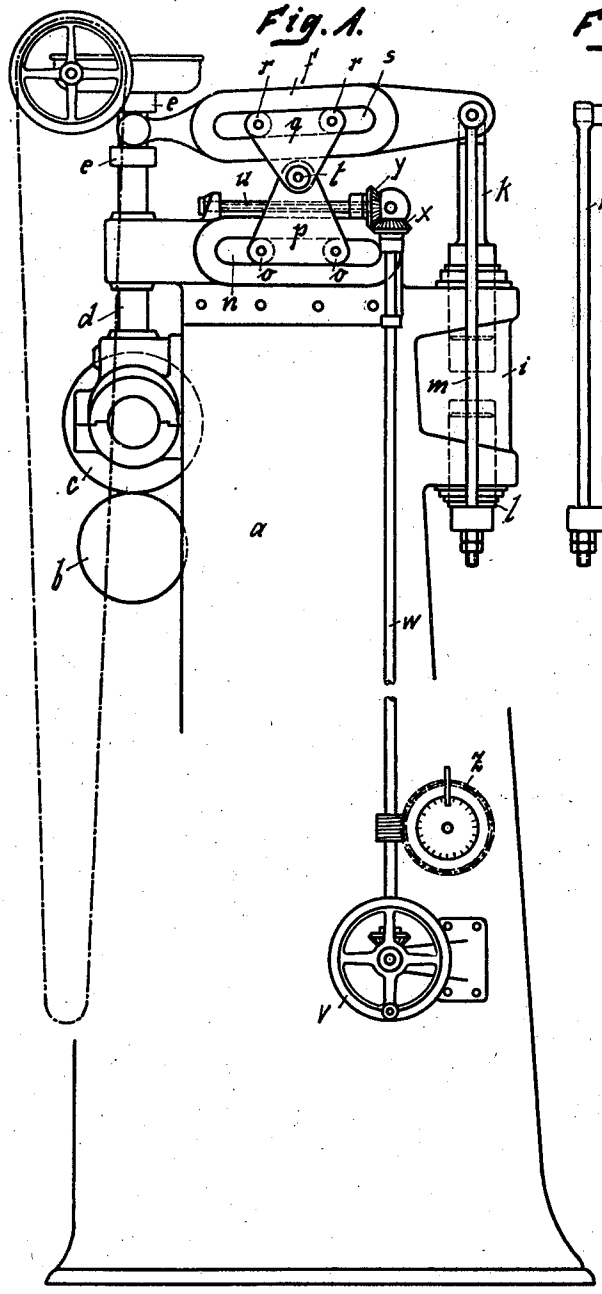
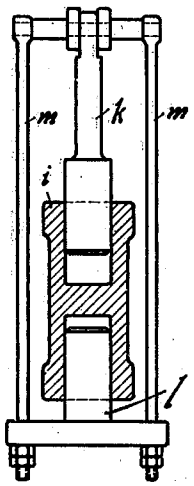


Fig. 2.



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Filed June 10, 1929 2 Sheets-Sheet 2

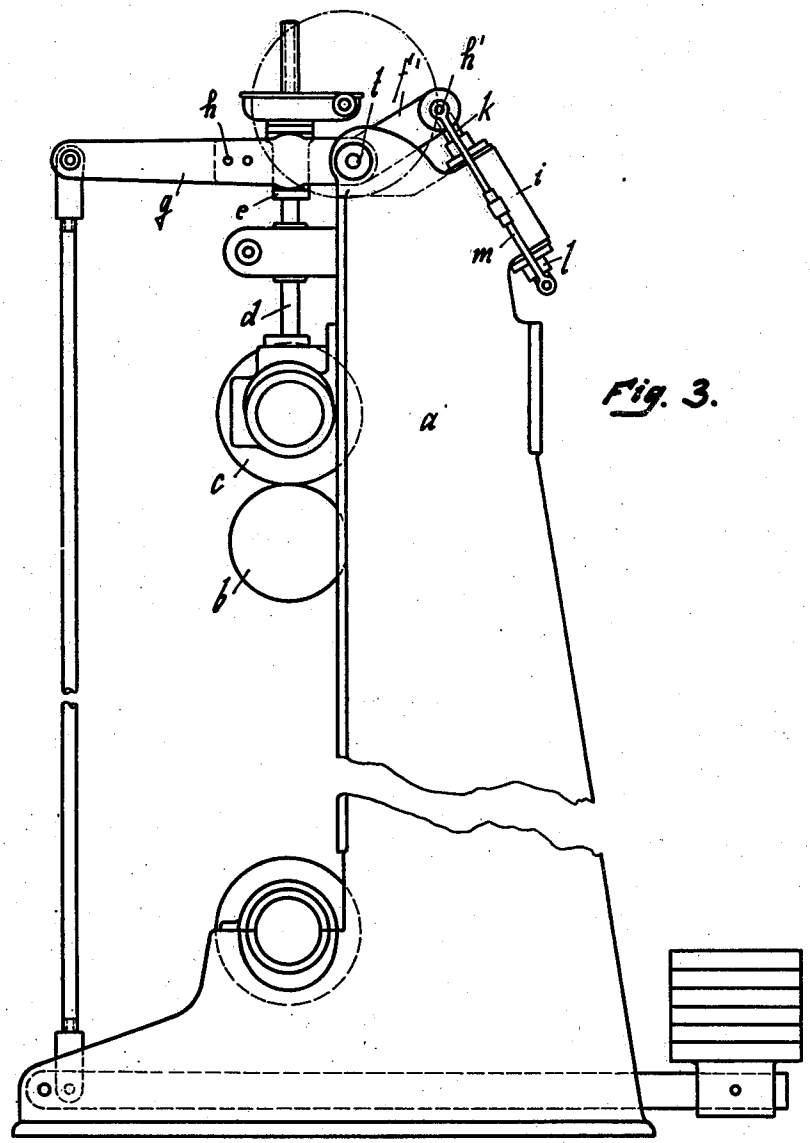


Fig. 3.

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UNITED STATES PATENT OFFICE

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CALENDER

Application filed June 10, 1929, Serial No. 369,899, and in Germany April 27, 1927.

This invention relates to an hydraulic pressure device on lever calenders, specially adapted for pressing leather but also for calendering fabric.

It has already been proposed to use as substitute for the commonly used loading of the calender rolls by heavy masses, hydraulic pressure exerted upon the upper and lower rolls by means of common pressure cylinders. By such devices the loaded rolls can be pressed against the intermediate roll; it is however impossible to lift the same hydraulically in a similar manner when the pressure ceases, so that therefore special arrangements must be provided, as for instance a spindle, the nut of which carries worm teeth meshing with a worm rotated by hand.

Together with these arrangements for adjusting the pressure roll by hand a hydraulically operated loading device is further provided according to the invention, which does not only enable a very accurate regulating of the load by changing the pressure difference in the two chambers of the pressure cylinder, but also permits of hydraulically lifting the pressure roll a short distance.

With this object in view the calender is fitted with a roll-loading device, which is controlled by means of two pairs of oppositely acting pressure pistons influencing the loading levers, one of each pair of pistons acting directly and the other through the intermediary of connecting rods upon the loading levers for the upper pressure roll. Both pistons can be operated by control valves alternately more or less, in order to load the calender or to reduce the loading or to suppress the same entirely and to lift the upper pressure roll.

The fulcrums of the loading levers may be adjustable, in order to permit of still more accurate regulating of the pressure on the two sides of the calender during the operation of the same. With this object in view the bearing brackets of the loading levers rest in guide slots of the uprights, and they are adapted to be adjusted individually or together by means of spindles and nuts together with hinge elements sliding in guide slots of the loading levers. In order to obtain very rapidly the pressure equalization, it is advisable to provide for the two loading levers one common driving gear, by means of which the fulcrums of the loading levers can be shifted simultaneously in opposite directions so that upon a pressure increase on one side of the calender a pressure decrease on the other side follows instantaneously.

The possibility exists, further, to load such a calender selectively hydraulically or mechanically. In this case the rolls are controlled by a lever mechanically loaded, in a manner known per se, and coupled with a two-armed lever controlled from the pressure cylinder and connected with the pressure and pulling pistons by means of a removable connecting bolt for the obtention of hydraulic pressure.

An embodiment of the invention is illustrated by way of example in the accompanying drawing in which

Fig. 1 is a side elevation of the calender,

Fig. 2 shows the hydraulic pressure device,

Fig. 3 shows in side elevation a modified construction of the calender.

The pressure rolls b, c are guided in the uprights a in a manner known per se. The position of the upper pressure roll c can be adjusted by means of two spindles d adapted to be adjusted in a manner known per se. On each spindle b a nut e is screwed with which engage the ends of the loading levers f for the upper pressure roll c. On each upright a a hydraulic double cylinder i is mounted, which comprises two pressure pistons k and l acting in opposite directions. The pistons k act directly and the pistons l through the intermediary of connecting rods m upon the loading levers f. Both pistons can be operated more or less by control valves in a manner known per se.

In guide slots of the uprights a engage rollers o of bearing brackets p, the latter being hingedly connected to the loading levers by means of links q, the rollers r of which engage with guide slots f of the loading levers f, said links being hingedly con-

nected with the bearing brackets p at t. By horizontal spindles u screwed through nuts of the bearing brackets p the fulcrums t of the loading levers can be shifted. With this object in view a handwheel v is mounted at an easily accessible point on one of the uprights a. This handwheel rotates a rod w, the rotation being transmitted by bevel wheels x, y, upon the corresponding spindles. The connecting rods w on the two sides of the machine may be coupled with each other so that both fulcrums can be shifted simultaneously by means of one handwheel v.

By reversing the transmission on one of the sides of the calender or by using spindles u with oppositely directed threads the fulcrums of the loading levers can be adjusted in opposite directions, in order to effect more rapidly the equalization of pressure. A scale z serves for regulating the pressure.

In the form of construction of the calender shown in Fig. 3 the loading of the rolls can be effected either by lever pressure or hydraulically. With this object in view the upper roll c is controlled, in a manner known per se, by a mechanically loaded lever g fulcrummed at t. On the fulcrum axle t a two armed lever f' is further pivotally mounted. When the roll c has to be loaded by the lever pressure, one arm of the two-armed lever f' is rigidly connected with the loading lever g by means of a bolt h, the end of the other lever arm being free. For hydraulically loading the roll c the bolt h is removed and inserted at h' so that the lever f' is coupled with the hydraulic pistons.

I claim:—

1. A calender, specially for pressing leather and fabric, comprising in combination with pressure rolls, a device for loading the upper rolls consisting of two loading levers, of two double cylinders comprising each two pistons acting in opposite directions, the upper piston acting directly upon said loading levers, and of connecting rods connecting said lower pistons to the corresponding loading levers.

2. A calender as specified in claim 1, comprising in combination with the loading levers for the upper pressure roll, adjustable fulcrums for said loading levers.

3. A calender as specified in claim 1, comprising in combination with the loading levers for the upper pressure roll having each a horizontal slot and with the uprights of the machine having each a horizontal slot, a bearing bracket for each loading lever, rollers on the lower end of said bracket engaging with the guide slot in the corresponding upright, a hinge piece hingedly mounted on the upper end of said bearing bracket, and rollers on the upper end of said hinge piece engaging with the horizontal guide slot of the corresponding loading lever.

4. A calender as specified in claim 1, comprising in combination with the loading levers for the upper pressure roll having each a horizontal slot and with the uprights of the machine having each a horizontal slot, a bearing bracket for each loading lever, rollers on the lower end of said bracket engaging with the guide slot in the corresponding upright, a hinge piece hingedly mounted on the upper end of said bearing bracket, rollers on the upper end of said hinge piece engaging with the horizontal guide slot of the corresponding loading lever, and driving gears one for each adjustable bearing bracket for shifting said bracket and thereby the fulcrum of the corresponding loading lever.

In testimony whereof I affix my signature.

JOHANNES KLEINEWEFERS.