Dec. 23, 1952 J. H. McMAHON 2,622,556

ADJUSTABLE CYLINDER COATING MACHINE

Filed Nov. 5, 1951 2 SHEETS—SHEET 1

Fig. 1

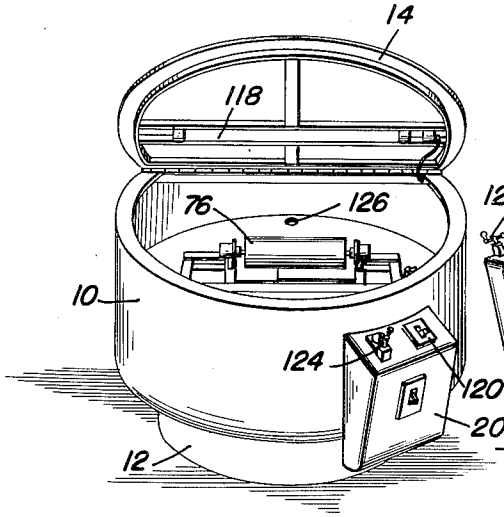


Fig. 2

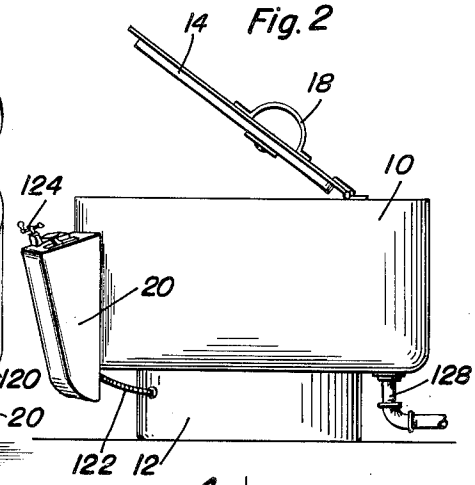


Fig. 3

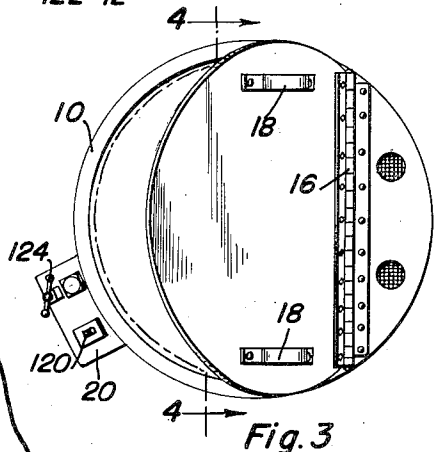
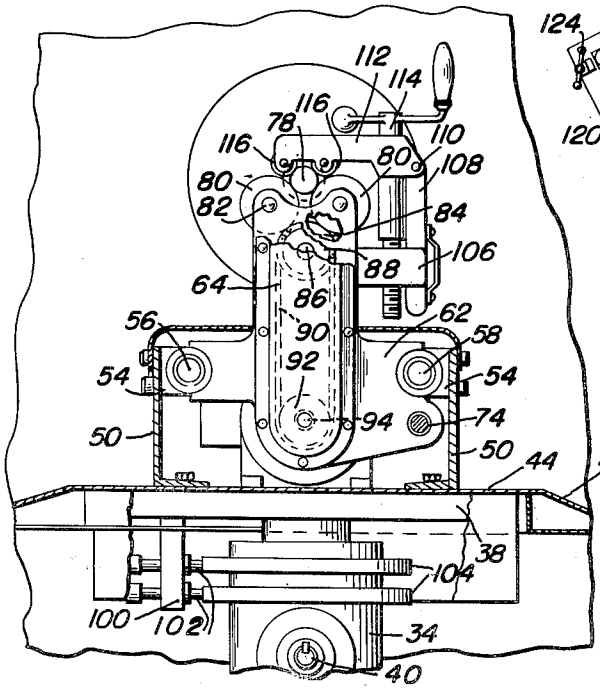


Fig. 5



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ADJUSTABLE CYLINDER COATING MACHINE

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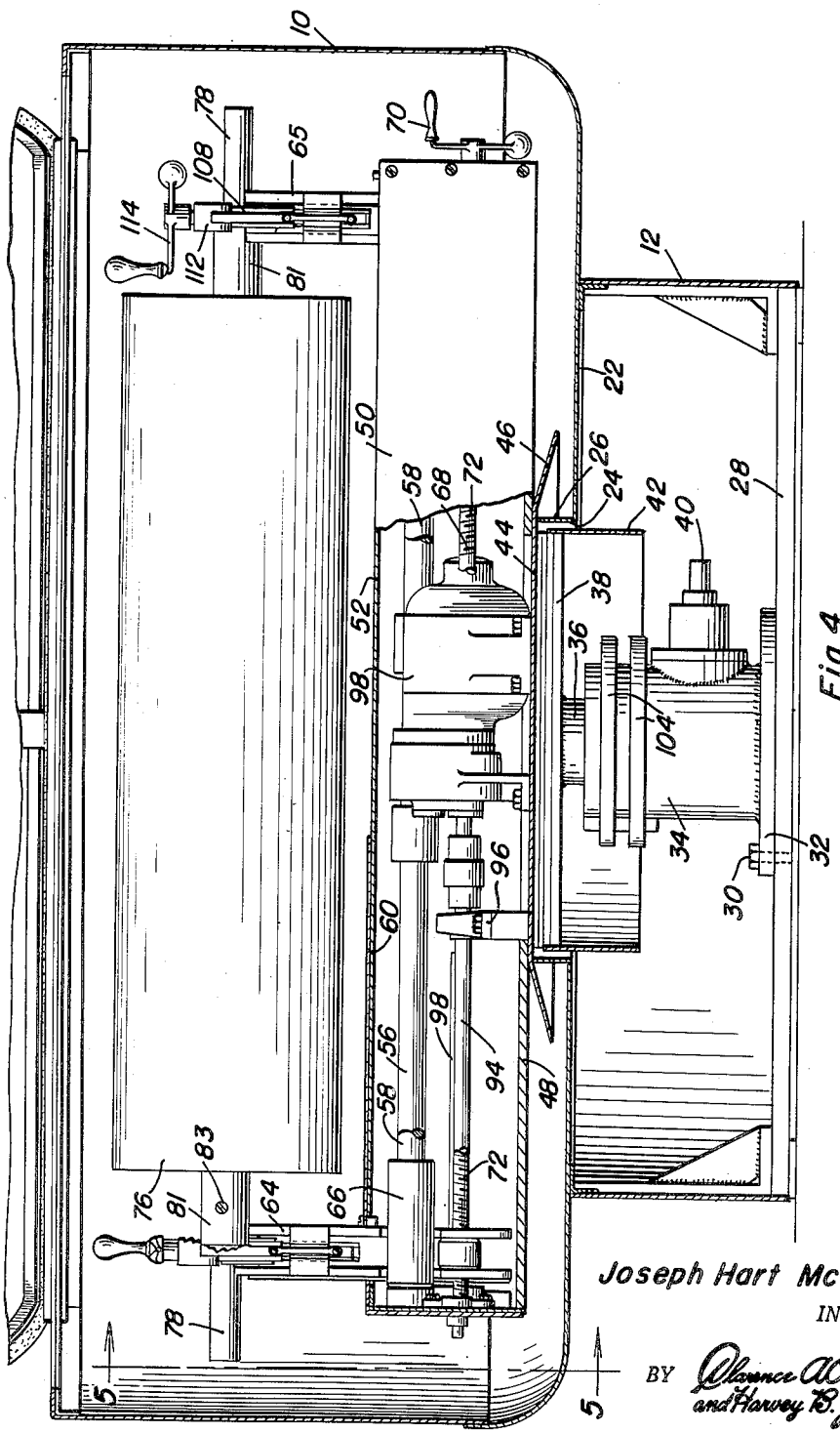


Fig. 4

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ADJUSTABLE CYLINDER COATING MACHINE

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10 Claims. (Cl. 118—53)

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This invention comprises novel and useful improvements in an adjustable cylinder coating machine and more specifically pertains to an apparatus for centrifugally and uniformly distributing a coating of a light sensitive emulsion to a cylinder of a photo-printing machine.

The primary object of this invention is to provide an apparatus for centrifugally applying uniform coatings of a light sensitive emulsion to the cylinders of photo-printing machines.

A more specific object of the invention is to provide an apparatus in conformity with the preceding object which shall have improved means for releasably securing a cylinder upon a supporting standard structure for rotation thereon during the application of a light sensitive coating to the cylinder.

Yet another object of the invention is to provide an apparatus in conformity with the foregoing objects which shall be readily adjustable to satisfactorily coat cylinders of different lengths and diameters with very simple adjustments of the apparatus to accommodate the same.

A still further object of the invention is to provide an apparatus as set forth hereinbefore having improved means for preventing the excess coating emulsion from contacting the driving mechanism and adjusting mechanism of the apparatus, and for draining the excess emulsion from the coating chamber of the machine.

A still further object of the invention is to provide an apparatus in conformity with the preceding objects wherein a coating drying lamp is mounted in an improved manner upon a portion of the apparatus.

And a final important object of the invention to be specifically enumerated herein, is to provide an apparatus of the character set forth in the above mentioned objects wherein the control of various elements of the apparatus may be readily effected from the exterior of the casing of the apparatus.

These, together with various ancillary objects and features of the invention, which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a perspective view of a suitable apparatus incorporating therein the principles of this invention, the cover of the coating chamber of the apparatus being raised to show the arrangement of certain internal parts of the apparatus;

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Figure 2 is a side elevational view of the apparatus as disclosed in Figure 1, taken from the right side thereof;

Figure 3 is a top plan view of the apparatus of Figure 2;

Figure 4 is a vertical sectional view, taken upon an enlarged scale substantially upon the plane indicated by the section line 4—4 of Figure 3 and showing certain parts of the apparatus in elevation and with a cylinder positioned in the apparatus for application of coating material thereto; and

Figure 5 is a vertical transverse sectional detail view taken substantially upon the plane indicated by the section line 5—5 of Figure 4, certain parts being broken away and shown in section.

Referring now more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, attention is directed first to Figures 1 and 2 wherein it will be seen that the apparatus consists of upper and lower casings or housings which may be of a cylindrical nature as shown, the upper casing 10 having a coating chamber therein, while the lower casing 12 constitutes a base supporting the upper chamber and has a lower chamber therein for housing certain portions of the mechanism.

The open end of the upper casing 10 is provided with a removable elosure 14 which is hinged as at 16 to a point of the casing and is provided with handles 18 for lifting the same.

Disposed in any suitable manner upon the exterior surface of the casing 10 is a housing 20 for mounting various control switches and control means for various portions of the apparatus as set forth hereinafter.

Referring now more specifically to Figure 4, it will be seen that the upper and lower casings 10 and 12 are separated by a partition 22 which constitutes the bottom of the upper casing and functions as a top for the base or lower casing. This partition is centrally apertured, being provided with an opening 24 by which communication is established between the coating chamber and the lower chamber, this opening having an upstanding annular flange or wall 26 rising a short distance above the partition 22. This wall constitutes means preventing liquid accumulating in the coating chamber from flowing downwardly into the lower chamber through the opening 24.

Detachably mounted upon the bottom wall 28 of the base 12 in the lower chamber as by means of fastening bolts 30 and flange 32 is a housing

34 which serves to journal the supporting and driving shaft 36 of a turntable 38 which extends through the opening 34 and is positioned within the coating chamber 10 and within the upstanding wall or rim 26.

The housing 34 journals the shaft 36 by any suitable means, not shown, and also houses the necessary gearing for connecting a drive shaft 40 with the shaft 36 for rotating the latter.

The shaft 40 may conveniently be driven by an electric motor, not shown, which may be housed within the lower chamber if desired, or may be housed without the chamber 12 and have any suitable driving engagement with the shaft 40 for rotating the latter and consequently the turntable 38.

Depending from the periphery of the turntable 38 is a cylindrical sleeve or skirt 42 which extends downwardly below the opening 24 and partition 22 into the bottom chamber. This depending skirt 42 constitutes a water spray shield preventing water or the like in the coating chamber from contacting the collector ring 104 when escaping through the opening 24.

Secured to the top of the turntable is a circular disk 44 which has its rim bent downwardly as at 46 to overlie and extend below the upper end of the upstanding sleeve 26. The rim 46 thus constitutes a liquid seal for the upstanding sleeve 26 tending to further prevent liquid accumulating in the coating chamber from being splashed over the rim 26 and down into the bottom chamber.

Mounted upon the top of the turntable 38 and upon the circular disk 44 is a flat elongated plate 48 which constitutes a supporting platform that is revoluble with the turntable. Mounted upon this platform are enclosing side walls 50 and a top wall 52 whereby a housing is formed.

As will be seen by reference to Figures 4 and 5, suitable mounting brackets 54 are carried by the side walls 50 and support parallel, horizontally extending guide rods 56 and 58 extending the length of and disposed on opposite sides of the housing carried by the turntable. The top wall 52 of the housing between the guide rods 56 and 58 is longitudinally slotted adjacent the ends of the same as at 60 and a pair of slides 62 are mounted upon the rods 56 and 58 for longitudinal sliding movement thereon, these slides having upwardly extending standards 64 and 65 which extend through and are movable in the slots 60.

To facilitate their guided and sliding movement upon the rods 56 and 58, the standards are provided with bearing sleeves or bushings, one of which is indicated at 66 in Figure 4, by means of which the standards and their supporting slides 62 are mounted upon the supporting rods.

In order to simultaneously move the two standards and their supporting slides in opposite directions upon the support rods 56 and 58, there is provided an adjusting rod 68, see Figures 4 and 5, which is suitably journaled in the end walls of the housing, being provided with a manually operable adjusting handle 70 upon the exterior of the housing. This adjusting shaft is provided with reversely disposed screw-threaded portions 72 at opposite ends of the same, these portions extending through screw-threaded bores in the slides 62 as indicated at 74 in Figure 5. Thus, upon rotation of the adjusting shaft 68, the two standards 64, 65 will be moved horizontally in opposite directions to vary the spacing therebetween and thus adapt the standards to accommodate different lengths of cylinders to which the sensitive emulsion is to be applied, such a

cylinder being indicated at 76 in Figure 4, and as having journaling pintles 78 at its ends.

At their upper ends, the standards 64, 65 are provided with a pair of supporting rollers 80, each rotatable upon a horizontally disposed axle 82 suitably journaled in the standards, these rollers being preferably provided with rubber tires or rims for rotatably supporting the pintles 78. The above mentioned pintles 78 are adapted to rest upon the upper surface of and between the upper surfaces of the rollers 80 as shown in Figure 5 whereby rotation of the rollers of the standard 64 will, through the friction gripping engagement of the same with the pintles 78, cause rotation of the cylinder 76.

Axial or endwise motion of the pintles 78 relative to the supporting rollers 80 is prevented by either providing the pintles with a diametrically enlarged portion or, as illustrated in Figure 4, with a pair of collars or bushing sleeves 81 each secured upon the pintles by a set screw 83, and having endwise abutting engagement with the rollers 80.

Rotation of the rollers 80 of the standard 64 is effected by a frictional driving roller 84 secured to an axle 86 suitably journaled within the bifurcated side walls of the standard 64, this axle in turn having a driving wheel in the form of a sprocket gear or other equivalent member 88, connected as by a driving belt 90 with a driving member 92 which is slidably but non-rotatably secured to the driving shaft 94.

The driving shaft 94 is journaled in suitable journal bearings, one of which is indicated at 96 in Figure 4, and extends longitudinally of the housing mounted upon the turntable and parallel to the support rods 56 and 58. The shaft 94 is provided with a full length spline or key 98 and the above mentioned driving sprocket or member 92 is slidable upon the shaft 94 but prevented from rotating thereon by the spline 98. It will thus be apparent that as the standards are adjusted by the adjusting shaft 68, the driving engagement of the drive shaft 94 with the friction drive rollers 80 remains unbroken. As will be readily understood, the driving belt or chain 90 positioned between the bifurcated upper ends of the standards 64 passes down through the hollow interior of the same and about the driving member 92.

At substantially its mid-point, the drive shaft 94 is provided with power driving means consisting of an electric motor 98 detachably mounted upon the turntable as shown in Figure 4, and connected in any suitable manner as through gearing, not shown, with the drive shaft 94.

Current for the electric motor 98 may be supplied from any suitable source to the motor in any desired manner, but since the details of electrical circuits form in themselves no part of this invention, and are well known to those skilled in the art, further description and illustration of the same appears to be unnecessary.

However, it may be noted from Figures 4 and 5 that the turntable may carry a depending member 100 having brushes 102 thereon which, in turn, are connected with the motor, and which bear against a pair of collector rings 104 stationarily and insulatingly mounted upon the casing 34 and connected with any suitable source of electric current.

Means are provided for removably securing and clamping a cylinder 76 upon the standard 64. Such clamping means may conveniently comprise

a laterally extending bracket 106 secured to each of the standards 64, which bracket has an upstanding pillar 108 secured thereto, to the upper end of which is pivotally connected as by a pivot pin 110, a horizontally extending clamping arm 112. A thumb screw 114 extends through the arm 112 and is screw-threadedly engaged into the standard supporting lug 106 whereby the arm 112 can be vertically pivoted upon the pillar 108.

Journaled upon the underside of that portion of the arm 112 which overhangs or overlies the friction drive rollers 80, are a pair of pressure wheels 116 which likewise may be of rubber tired construction, and which are adapted to press down upon and engage the top of the pintle 78 to thereby clamp the latter in frictional driving engagement upon the drive rollers 80.

It will be readily appreciated that the adjustment of the arm 112 permits cylinders of different diameter, having pintles of different size to be readily accommodated by the apparatus as disclosed.

Mounted in the cover 14 and upon the underside of the same in any convenient manner is a cylinder coating drying means in the form of an infra-red lamp or any other suitable heating element, indicated at 118 in Figure 1. When the cover is closed, this heating member is adapted to closely overlie a cylinder for thus baking or quickly drying the cylinder during rotation of the same. Current for the heating 118 may be supplied from any suitable source and any suitable control means, and may conveniently be under the control of a switch such as the switch 120 mounted upon the housing 20.

Control of the electric motor 93 as to its speed may be effected by any suitable control on the motor extending through a flexible cable 122 and into the housing 20 under the control of a wheel or hand lever 124.

As shown in Figure 1, the partition or bottom wall 22 of the coating chamber is provided with a drain opening 126, which as shown in Figure 2 is connected by a drain conduit 128 to any desired place of discharge. Thus, any liquid accumulating within the coating chamber will automatically be drained therefrom by the drain 126 and conduit 128, thereby preventing the same from overflowing through the opening 24 into the lower chamber.

The operation of the apparatus is as follows. A cylinder to be coated is clamped upon the driving rollers in the coating chamber, and as the cylinder is slowly rotated by energization of the electric motor 93, an emulsion coating is slowly applied to the cylinder beginning at one end and continuing to the other end thereof. After this coating has been applied, the cover 14 is closed, and the cylinder is caused to rotate about its longitudinal or horizontal axis in any desired rate of speed, while the turntable itself is rotated at a desired speed. Thus, the cylinder is subjected to rotary motion about two perpendicular axes whereby centrifugal force will cause the coating to spread evenly throughout the entire area of the cylinder with excess coating being thrown therefrom into the coating chamber and subsequently removed as hereinbefore set forth.

The cylinder is frictionally driven from one end only and as above pointed out the device is readily adjustable to accommodate different sizes of cylinders.

From the foregoing, the construction and operation of the device will be readily understood

and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A centrifugal coating machine for applying sensitized coatings to photo-printing machine cylinders, comprising a base having a lower chamber therein, a housing having a coating chamber therein and mounted upon said base, a partition separating said lower and coating chambers and having an opening establishing communication therebetween, a turntable in said coating chamber mounted for rotation about a vertical axis, means in said base supporting and rotating said turntable, a pair of supporting standards on said turntable, means on said standards for rotatably supporting a cylinder in a horizontal position, means for releasably securing a cylinder upon said standards, means on said turntable for causing rotation of said cylinder supporting means, said coating chamber having an upstanding rim about said opening, said turntable having a peripheral downwardly sloping flange upon its upper surface overlying the upper edge of said rim.

2. The combination of claim 1, including means communicating with the interior of said coating chamber through said partition for draining liquid accumulating therein.

3. The combination of claim 1, wherein said turntable has an annular depending sleeve disposed in said opening and extending below said partition.

4. A centrifugal coating machine for applying sensitized coatings to photo-printing machine cylinders, comprising a base having a lower chamber therein, a housing having a coating chamber therein and mounted upon said base, a partition separating said lower and coating chambers and having an opening establishing communication therebetween, a turntable in said coating chamber mounted for rotation about a vertical axis, means in said base supporting and rotating said turntable, a pair of supporting standards on said turntable, means on said standards for rotatably supporting a cylinder in a horizontal position, means for releasably securing a cylinder upon said standards, means on said turntable for causing rotation of said cylinder supporting means, said means on said standards comprising pairs of friction driving rollers journaled on said standards for rotation about horizontal axes, said rollers being adapted to support and drive a cylinder.

5. A centrifugal coating machine for applying sensitized coatings to photo-printing machine cylinders, comprising a base having a lower chamber therein, a housing having a coating chamber therein and mounted upon said base, a partition separating said lower and coating chambers and having an opening establishing communication therebetween, a turntable in said coating chamber mounted for rotation about a vertical axis, means in said base supporting and rotating said turntable, a pair of supporting standards on said turntable, means on said standards for rotatably supporting a cylinder in a horizontal position, means for releasably securing a cylinder upon said standards, means on said turntable for causing rotation of said cyl-

inder supporting means, said means on said standards comprising pairs of friction driving rollers journaled on said standards for rotation about horizontal axes, said rollers being adapted to support and drive a cylinder, a drive shaft mounted on said turntable, means on said drive shaft at each end thereof for driving said rollers, means mounted in said standards connecting said last means to said rollers.

6. The combination of claim 4, wherein said connecting means includes a friction drive roller journaled in each standard and disposed below and frictionally engaging the pair of rollers mounted on each standard.

7. A centrifugal coating machine for applying sensitized coatings to photo-printing machine cylinders, comprising a base having a lower chamber therein, a housing having a coating chamber therein and mounted upon said base, a partition separating said lower and coating chambers and having an opening establishing communication therebetween, a turntable in said coating chamber mounted for rotation about a vertical axis, means in said base supporting and rotating said turntable, a pair of supporting standards on said turntable, means on said standards for rotatably supporting a cylinder in a horizontal position, means for releasably securing a cylinder upon said standards, means on said turntable for causing rotation of said cylinder supporting means, said turntable having a pair of horizontal support rods mounted thereon, said standards each comprising a slide mounted on said rods for movement therealong.

8. The combination of claim 7, including means for simultaneously adjusting said slides towards and from each other.

9. The combination of claim 7, including means for simultaneously adjusting said slides towards and from each other, said last means comprising a rod having reversely screw-threaded portions engaged in each slide.

10. A centrifugal coating machine for applying sensitized coatings to photo-printing machine cylinders, comprising a base having a lower chamber therein, a housing having a coating chamber therein and mounted upon said base, a partition separating said lower and coating chambers and having an opening establishing communication therebetween, a turntable in said coating chamber mounted for rotation about a vertical axis, means in said base supporting and rotating said turntable, a pair of supporting standards on said turntable, means on said standards for rotatably supporting a cylinder in a horizontal position, means for releasably securing a cylinder upon said standards, means on said turntable for causing rotation of said cylinder supporting means, said means on said standards comprising pairs of friction driving rollers journaled on said standards for rotation about horizontal axes, said rollers being adapted to support and drive a cylinder, said releasably securing means comprising a clamp arm pivotally connected to each standard, rollers journaled on each arm and adapted to engage a cylinder and hold the same upon said first mentioned rollers, fastening means securing said arms in pivotally adjusted positions.

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