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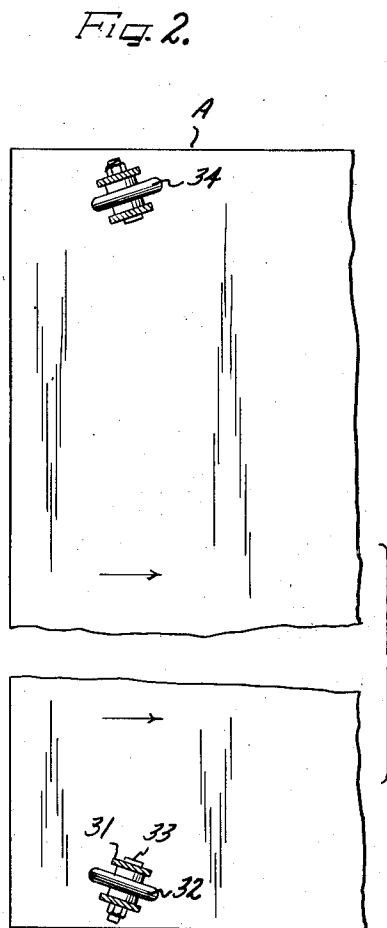
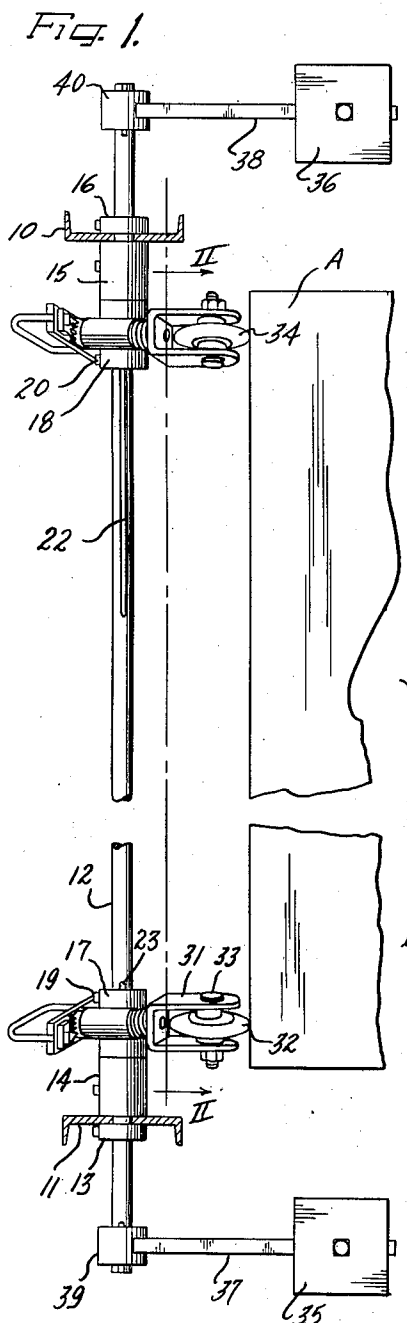
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2,461,376

SHEET STRETCHING MECHANISM

Filed May 28, 1947

2 Sheets-Sheet 1



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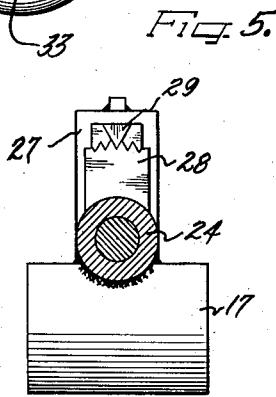
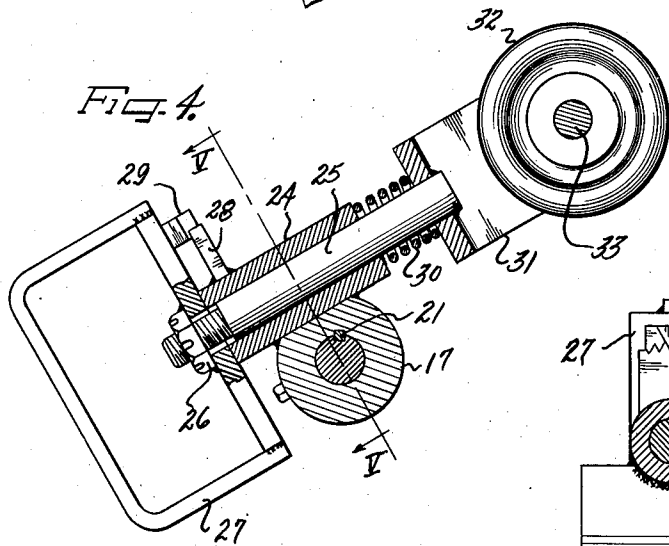
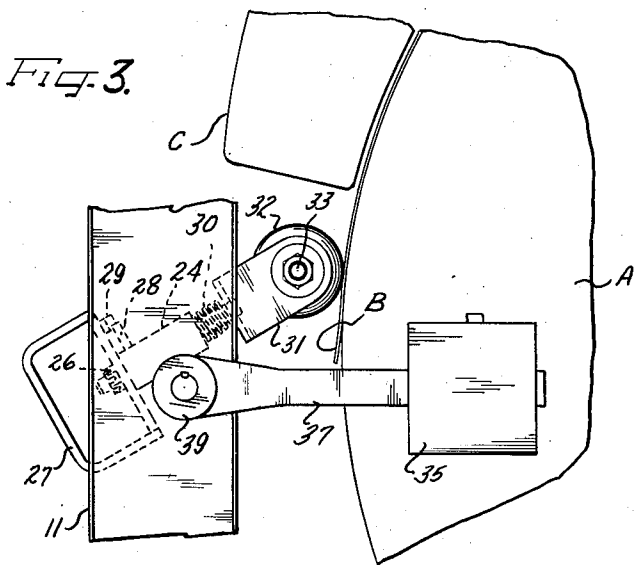
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SHEET STRETCHING MECHANISM

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SHEET STRETCHING MECHANISM

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3 Claims. (Cl. 271-52)

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This invention relates to a mechanism for stretching or tightening sheets of paper which are being fed to moving surfaces such as a rotating drum so that the sheets may lie flatly upon the drum or other moving surface.

The present invention finds a particular use in the stretching or tightening of sheets which have just been printed and on which the ink or colored pigments are still moist, preventing the use of an ordinary roller such as could be used for pressing plain sheets of paper flatly upon the drum or other moving surface. The occasion for the use of the invention arises in the problem of passing these freshly printed sheets over drying drums.

One of the objects of the invention is to provide mechanism for gripping sheet material at its lateral edges while supported on a moving surface to stretch the sheet material flatly and tautly upon said surface.

Another object of the invention is to provide a mechanism to be mounted adjoining a rotating drum for gripping sheet material along its lateral edges for stretching it tautly on the surface of the drum.

Another object of the invention is to provide a mechanism having the foregoing advantages constructed to be readily adjustable laterally of the moving surface so that it may cooperate with sheets of different widths.

Another object of the invention is to provide a mechanism having the foregoing advantages and which maintains a stationary position relatively to the moving surface.

Other objects and advantages of the invention will be mentioned hereinafter or will become apparent from a perusal of the specification and drawings in which a preferred embodiment of the invention is shown and described.

On the drawings:

Figure 1 is a top plan view showing an apparatus constructed in accordance with this invention, mounted adjoining a drum;

Figure 2 is a sectional view on the line II—II of Figure 1;

Figure 3 is a side elevation of one of the units employed in the apparatus;

Figure 4 is a partial sectional view through the unit shown in Figure 3; and

Figure 5 is a sectional view on the line V—V of Figure 4.

Referring now to the drawings, there is shown a partial view of a drum A, the structure, mounting and means of rotation of which do not form a part of this invention.

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Adjoining the drum and supported on suitable frame members 10 and 11 is a rock shaft 12 positioned in the frame against longitudinal movement, but free to rotate, by means of locking collars 13, 14, 15 and 16. These collars may be secured to the rock shaft by means of set screws or other appropriate devices. Slidably positioned upon the rock shaft are the sleeves 17 and 18 which may be secured thereon against slidable or rotary movement by means of set screws 19 and 20 and keys such as 21 engaged in keyways 22 and 23.

Secured to the sleeves 17 and 18 are the mountings for the wheels. As these two mountings are identical only one of them will be herein described. A sleeve 24 is preferably welded to the sleeve 17, and slidably positioned in the central bore of the sleeve 24 is a shaft 25 to which is secured by means of the nut 26 a handle 27. As indicated in the drawings, the nut 26 is threaded onto shaft 25 but is thereafter welded peripherally to the handle so that the handle and shaft may be rotated unitarily. A toothed sector 28 is welded to the surface of the sleeve 24 for cooperation with a single tooth 29 which is secured in any suitable manner, as by welding to the handle 27. By pulling the handle 27 against the action of the compression spring 30 the tooth 29 may be disengaged from any of the teeth of the sector 28 and reengaged at some other angle.

The inner end of the shaft 25 carries a yoke 31 in which is rotatably mounted a rubber tired wheel 32 on the pin 33. The rubber used should be soft enough to grip the paper by the application of moderate pressure.

It is apparent that the operator may by means of the handle 27 position the wheel 32 so that its axis will lie in a plane passing through the axis of the wheel and the axis of the drum, in which case the roller would rotate exactly parallel to the rotation of the drum, without any stretching action on sheet material passing over the drum. However, if the operator rotates the shaft 25 so that the axis of the wheel 32 moves out of the aforementioned plane, the wheel will be canted relatively to the surface of the drum, and such canted position is illustrated in Figures 1 and 2.

Therefore, if a sheet B is fed to the drum and passes under the wheels such as 32 and 34, which are oppositely canted, the contact of these wheels with the sheet will tend to stretch the sheet and hold it tautly on the surface of the drum, while pressing it against the drum.

In order to provide a constant pressure of the wheels against the drum, and to make provision

for adjusting that pressure, I provide a pair of weights 35 and 36 adjustably mounted on arms 37 and 38 integral with hubs 39 and 40 which may be keyed and locked upon the opposite ends of the rock shaft 12.

When the drum A is rotating in the direction of the arrows shown in Figure 2, the rolling contact of the rubber tired wheels will provide a constant stretching action laterally upon the opposite lateral margins of the sheet material. The amount of canting of the wheels is subject to the judgment of the operator and is readily accomplished and maintained by the structure herein shown. The amount of pressure can be varied by means of the weights illustrated.

Figure 3 suggests that the paper after being stretched by the rollers passes under a hood C, a portion of which is shown, which for illustrative purposes, may be considered as a portion of a drying hood mounted adjacent the drum.

The advantage of using this stretching mechanism will be more readily appreciated when it is recalled that if a sheet of paper be covered with fresh ink or other colored material across its entire surface, with the exception of narrow margins which are usually left free for handling, this mechanism provides a means for placing the sheets flatly upon the drum without smearing the ink or other moist material on their surfaces.

Thus, not only may the sheets be prevented from lying on the sheet conveyor in buckled or rippled formation, but the flattening of them in the manner herein described serves to expel pockets of air which otherwise might become trapped under them.

As the sheets of printed material may, from time to time, have different widths, the present invention provides that one of these wheels may be adjusted as far as is necessary longitudinally along the rock shaft 12, so that it may grip the margin of narrower sheets being processed.

The stretching or tightening mechanism herein shown may advantageously be located where it will act upon the sheets immediately after their leading edges are fed to the drum or other form of sheet conveyor. The sheets may, if desired, thereafter be gripped and held flatly by other gripping mechanisms while retained on the drum or conveyor.

It should be understood that the invention is not limited to the precise details of construction herein shown, but is susceptible of some variation and modification without departing from the spirit and scope of the invention, particularly as it is defined in the appended claims.

I claim as my invention:

1. In combination with a drum mounted for horizontal rotation, apparatus for stretching flatly upon said drum surface a sheet of paper carried thereon, comprising a rock shaft mounted adjacent the drum and parallel to the axis thereof, a rotatable shaft and a rubber-tired wheel supported thereon for rotation in contact with the drum surface, means mounting said wheel supporting shaft for rotation about its longitudinal axis and for securing it to said rock shaft for bodily rocking movement therewith, manually controllable means associated with said mount-

ing for selectively canting the axis of the wheel relative to the axis of the drum, and a similar wheel and mounting therefor adjustably positioned on another portion of said rock shaft and arranged for canting oppositely to the cant of the first wheel whereby when the two wheels engage opposite margins of the sheet disposed on the drum the rotation of the drum and wheels will serve to stretch the sheet upon the drum.

2. In combination with a drum mounted for horizontal rotation, a rock shaft mounted parallel to the drum axis but spaced apart from the drum periphery, means for urging the rock shaft to rotate in one direction, a pair of sleeve members mounted on said rock shaft at spaced apart positions, means securing said members on the rock shaft in non-rotatable relation thereto but longitudinally adjustable thereon, a pair of wheel supporting shafts and means mounting them on said members for independent rotation in said mounting but to cause them to rock bodily with said members and rock shaft, a rubber-tired wheel rotatably supported by each shaft and arranged to contact said drum, and manually controllable means for rotatably adjusting each wheel supporting shaft independently for adjustably canting the wheel carried thereby relatively to the drum axis.

3. In combination with a drum mounted for horizontal rotation, a rock shaft mounted parallel to the drum axis but spaced apart from the drum periphery, means for urging the rock shaft to rotate in one direction, a pair of sleeve members mounted on said rock shaft at spaced apart positions, means securing said members on the rock shaft in non-rotatable relation thereto but longitudinally adjustable thereon, a pair of wheel supporting shafts and means mounting them on said members for independent rotation in said mountings but to cause them to rock bodily with said members and rock shaft, the wheel supporting shafts also being slidable longitudinally in said mountings, a handle secured to each last said shaft for rotating the latter, cooperative means on each handle and on each member for retaining each shaft in any of several positions to which it may be rotated relatively to such member, a spring acting on each shaft to yieldably hold said cooperative means in operative position, a rubber-tired wheel rotatably supported on each shaft and arranged to contact said drum.

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