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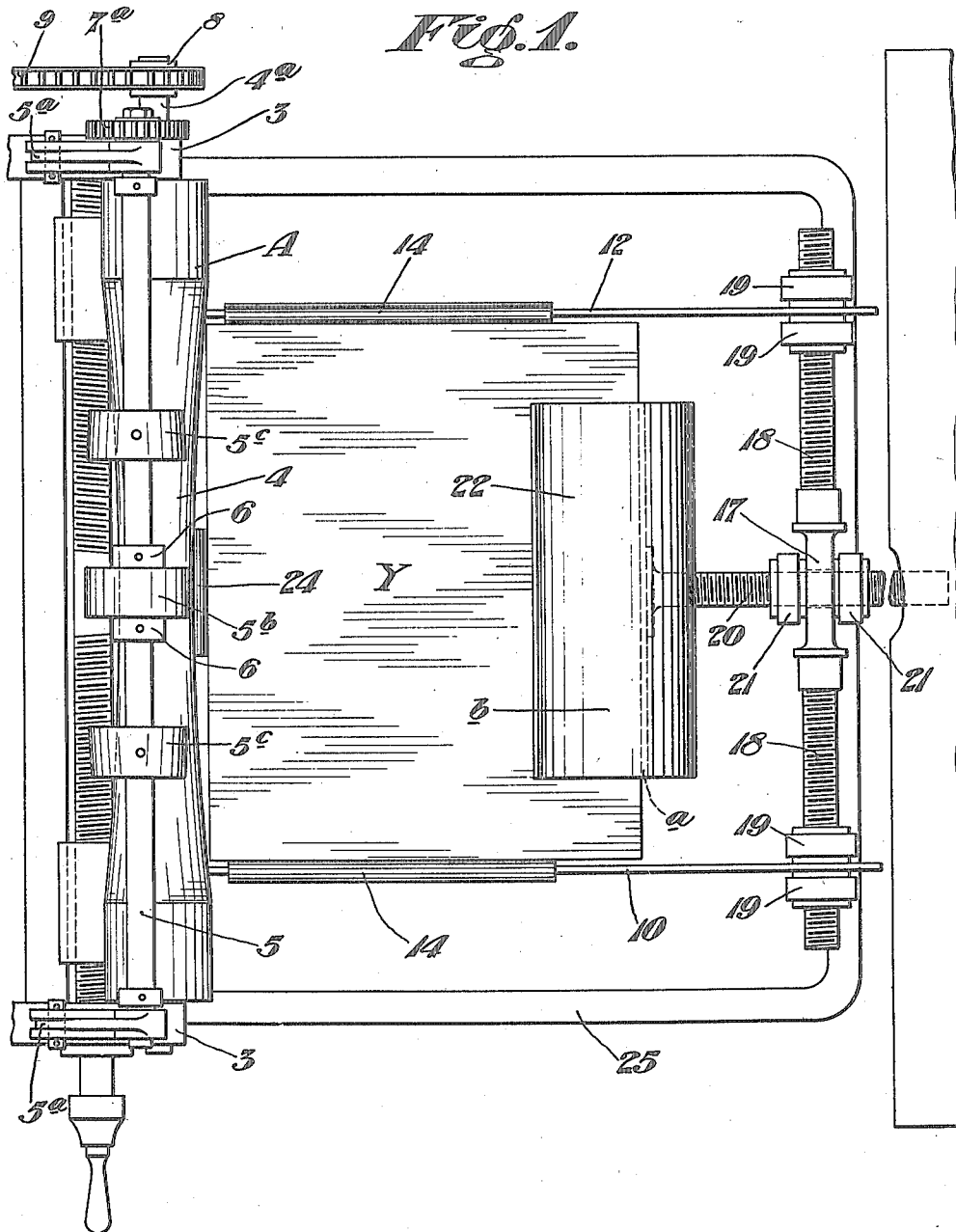
1,685,873

A. D. EVANS ET AL

FEED ROLLERS

Filed Sept. 28, 1927

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

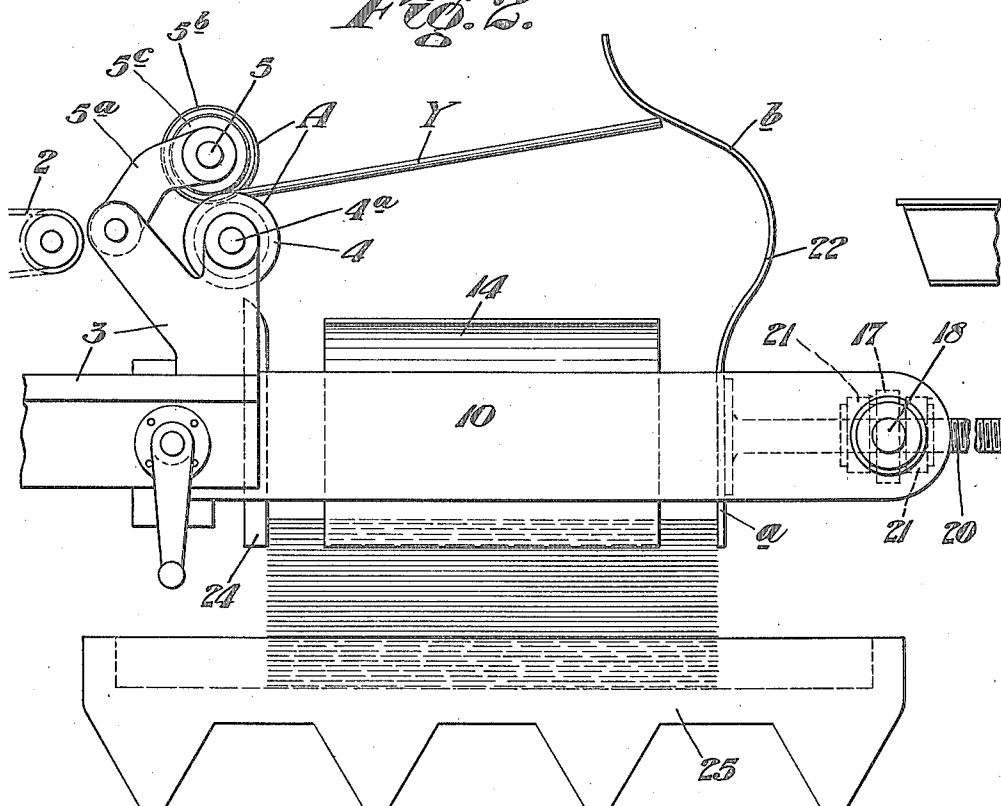
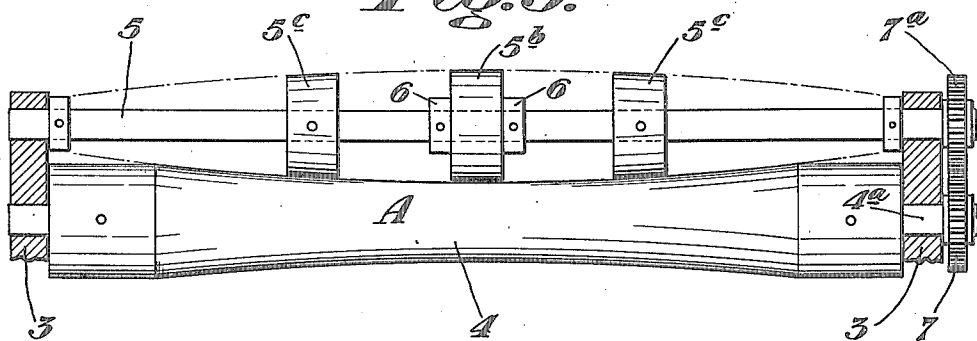


Fig. 3.



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UNITED STATES PATENT OFFICE.

ARCHIBALD D. EVANS AND JAMES K. LAMOREE, OF NEW CASTLE, PENNSYLVANIA, ASSIGNORS TO AMERICAN SHEET AND TIN PLATE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

FEED ROLLERS.

Application filed September 28, 1927. Serial No. 222,681.

This invention relates to feed rollers and while not limited thereto, relates to feed rollers for feeding sheets and plates horizontally into a piling and packing mechanism such as shown and described in our co-pending application, Serial No. 222,680 filed Sept. 28, 1927.

The rollers of this application are adapted to replace feed rollers one of which is concave and the other of which is convex so as to bend the sheets transversely as they are fed therethrough, thus stiffening them. The rollers of this application form a substantial improvement over the conventional concave and convex rollers in that they may be operated at a higher speed.

With the full length conventional concave and convex rollers turning at constant speeds, it is evident that the surface speed of either roll will vary according to the location at which the surface speed is considered.

Were it practical to turn two curved rollers, one concave and the other convex, and bring about full length surface contact, it would still be difficult to maintain exact surface speeds at equal opposite points from the center of the rollers, due to the tendency of the larger diameters to increase and the smaller diameters to reduce, the surface speed, which becomes an average or mean variable according to the width of the sheet passing through the rollers.

Furthermore, due to the "cutting out" effect of the sheets or plates, warping of the rollers and wear on the bearings, it is impractical to retain full length roller contact.

The loss of true bearing, one roller upon the other, produces two-point contact, one point on either side of the center of the rollers, generally at unequal distances from the center of the rollers.

In passing sheets or plates through rollers having unequal two-point contact, the sheets or plates are caused to turn from the true center line so that when said sheets or plates are being delivered to a piler and packer such as shown in our co-pending application, or similar mechanism, the sheets will be delivered with their side edges twisted out of parallel with the edges of the piler guides so as to interfere with the correct operation of the piler or similar mechanism.

The present rollers are designed so as to cause an even feeding of the sheets and

plates and overcome all the objections and disadvantages of the solid or continuous concave and convex rollers.

In the drawings—

Figure 1 is a plan view of a piling and packing apparatus having this invention embodied therein.

Figure 2 is a side elevation thereof.

Figure 3 is a front elevation of the feed rolls.

Referring more particularly to the drawings, the numeral 2 designates a conveyer for delivering the sheets and plates to the feed rollers A.

The rollers A are journaled in the packer and piler frame 3 and comprise a lower concave roller 4 and an upper roller composed of a shaft 5 journaled in a pair of arms 5^a pivotally secured to the frame 3, and center and end roller disks 5^b and 5^c, respectively. The center disk 5^b is mounted for free rotation on the shaft 5 at a point in line with the center of the roller 4 and is of such diameter that it is normally spaced slightly from the roller 4. Collars 6 are secured on the shaft 5 to prevent movement of the disk 5^b longitudinally of the shaft 5. The end roller disks 5^c are keyed or otherwise secured to the shaft 5 so as to rotate with said shaft. The disks 5^b and 5^c have their peripheries curved to correspond or match the curvature of the concave bottom roller 4.

The bottom roller 4 has its shaft 4^a extended and a pinion 7 is secured thereon which is meshed with a pinion 7^a on the roller shaft 5 so that the rollers will be compelled to operate in unison. The shaft 4^a is also provided with a sprocket 8 to receive a drive chain 9 which is also connected to a source of power (not shown) and is adapted to drive the rollers A.

The packer and piler consists of a pair of transversely adjustable side bars 10 and 12, which carry side guide-plates 14.

A mounting disk 17 is provided with diametrically opposite screw-threaded arms 18, which arms project through apertures adjacent the rear ends of the side bars 12 and 13, and are held in place by jam-nuts 19.

The disk 17 is provided with a centrally disposed aperture in which a threaded bar 20 is slidably mounted. A pair of jam-nuts 21 are provided on the bar 20 for locking said bar in position in said disk.

A combined stop and guide-plate 22 is secured to the inner end of the bar 20 and comprises a vertical pile forming portion *a*, and a curved guide portion *b*. The curved guide portion *b* of the plate 22 is bent forwardly in the direction of travel of the sheets and plates, from the upper end of the vertical pile forming portion *a*, and then curved rearwardly and upwardly so as to extend materially rearward of the vertical plane of the vertical portion *a*.

A rear pile guide 24 is secured to the frame 3 to guide the rear end of the sheets and plates.

An annealing box base 25 or other support is adapted to be located below the packing and piling mechanism to receive the pile of sheets or plates.

In operation, the roller disks 5^a of the top roller of the rollers A bear on the bottom roller 4 at points equidistant from the center of the rollers and revolve at the same speed as the bottom roller so that the sheets and plates will be fed evenly and straight between said rollers. The idler disk 5^b serves to depress the sheets or plates so as to bend the sheets or plates transversely and produce the proper "set" to support the sheets and plates in a horizontal plane. The idler disk 5^b, however, has clearance with respect to the bottom roller 4 so as not to force the sheets into contact with the relatively slow moving bottom rollers, and such idler disk is driven by the sheets or plates so as to revolve at the common surface speed of the sheets or plates.

The sheets or plates Y are fed into the bite of the rollers A, which, due to their novel construction, will bend the sheets or plates transversely as set forth above, so as to prevent dipping or sagging. The rollers A will project the sheets or plates forwardly against the stop-plate 22 at a point adjacent its upper end and, due to the novel curved shape of the stop-plate 22, the forward end of the sheet or plate will be guided downwardly while it is still being projected forwardly. The curve of the stop-plate 22 is sufficient to permit the sheets or plates being piled to pass free from between the rollers A, and thereby be free to pile.

While we have shown and described one specific form of our novel feed rollers in connection with a sheet or plate packer and piler, it will be understood that we do not wish to be limited to the specific form of said rollers, or to their use with a sheet packer and piler, since modifications of said rollers will be readily apparent to those skilled in the art and such rollers may be used to deliver sheets and plates to various mechanisms, without departing from the scope of our invention as defined in the appended claims.

We claim—

1. Feed rollers for delivering sheets and plates comprising, in combination, a concave roller, a shaft arranged parallel to said con-

cave roller, a disk mounted intermediate the ends of said shaft and spaced from said concave roller, at least two other disks mounted on said shaft and spaced equidistant from the center of said shaft and concave roller, said last named disks being in contact with said roller.

2. Feed rollers for delivering sheets and plates comprising, in combination, a concave roller, a shaft arranged parallel to said concave roller, an idler disk mounted for free rotation on said shaft at a point intermediate the ends of said shaft, said idler disk being spaced from said concave roller, at least two other disks mounted on and fixed to said shaft and spaced equidistant from the center of said shaft and concave roller, said last named disks being in contact with said roller.

3. Feed rollers for delivering sheets and plates comprising, in combination, a concave roller, a shaft arranged parallel to said concave roller, an idler disk mounted for free rotation on said shaft at a point intermediate the ends of said shaft, said idler disk being spaced from said concave roller, at least two other disks mounted on and fixed to said shaft and spaced equidistant from the center of said shaft and concave roller, said last named disks being in contact with said roller, and drive means connecting said roller and said shaft so as to cause uniform rotation thereof.

4. Feed rollers for delivering sheets and plates comprising, in combination, a concave roller, a shaft arranged parallel to said concave roller, an idler disk mounted for free rotation on said shaft at a point intermediate the ends of said shaft, said idler disk being spaced from said concave roller, at least two other disks mounted on and fixed to said shaft and spaced equidistant from the center of said shaft and concave roller, said last named disks being in contact with said roller and having their peripheries shaped to fit against the concavely curved face of said roller, and gearing connecting said roller and said shaft so as to cause uniform rotation thereof.

5. The combination with a sheet piling and packing apparatus, of a pair of feed rollers for delivering sheets to said piling and packing apparatus, said feed rollers comprising, in combination, a concave bottom roller, a shaft arranged above and parallel to said concave roller, an idler disk mounted for free rotation on said shaft at a point intermediate the ends of said shaft, said idler disk being spaced from said concave roller, at least two other disks mounted on and fixed to said shaft and spaced equidistant from the center of said shaft and concave roller, said last named disks being in contact with said roller, and gearing connecting said roller and said shaft so as to cause uniform rotation thereof.

In testimony whereof, we have hereunto signed our names.

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