Nov. 23, 1926. 1,608,152

B. D. WOOLLEY

CUTTING MACHINE

Filed Jan. 13, 1926 2 Sheets-Sheet 1

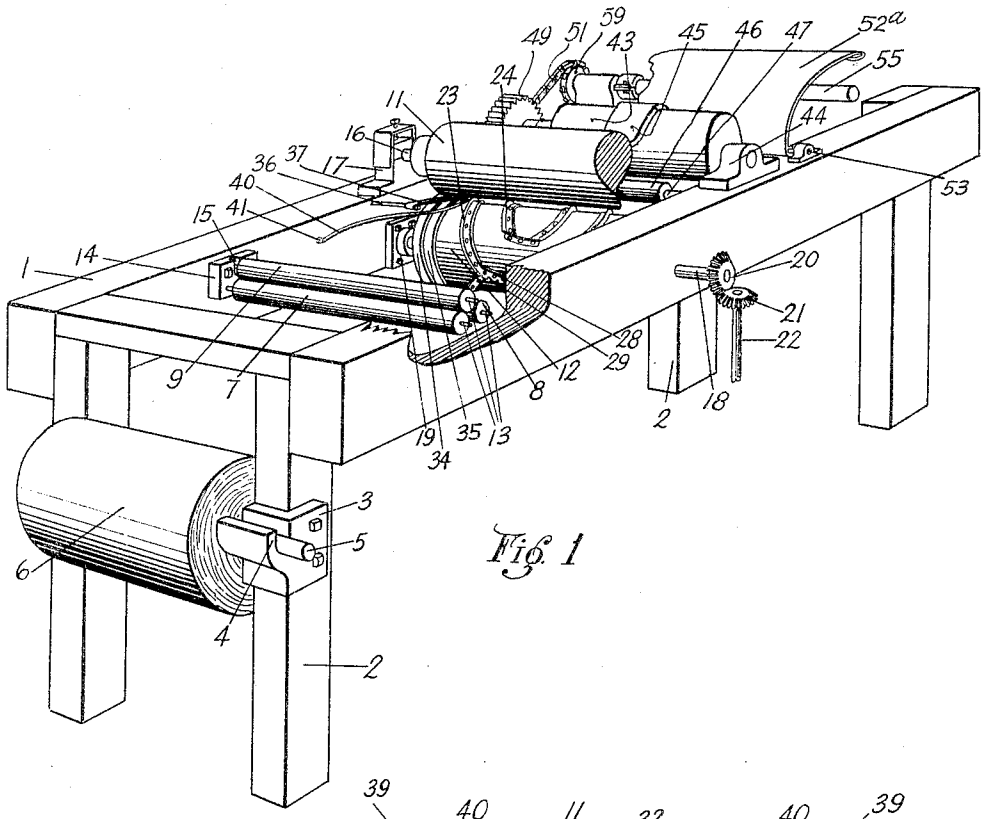


Fig. 1

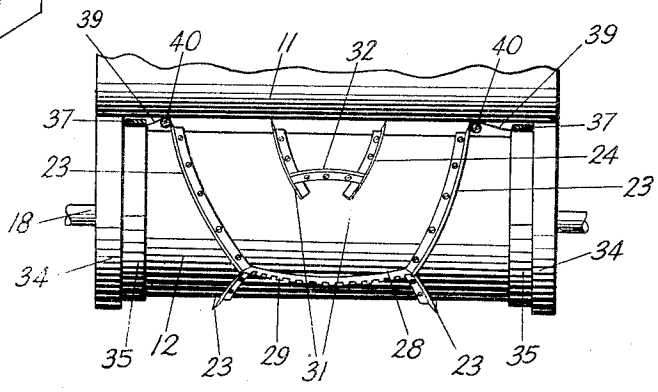


Fig. 2

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2 Sheets-Sheet 2

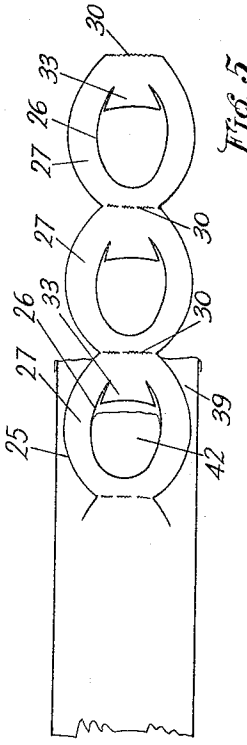


Fig. 5

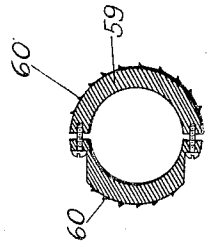


Fig. 4

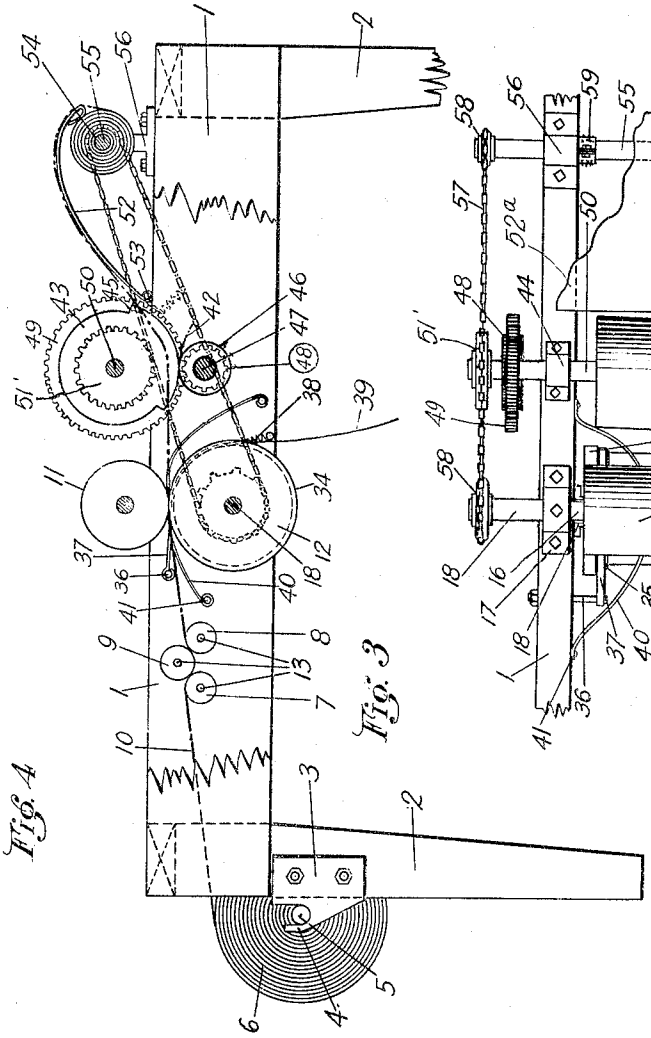


Fig. 3

Fig. 6

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Patented Nov. 23, 1926. 1,608,152

UNITED STATES PATENT OFFICE.

BRUCE D. WOOLLEY, OF JOHNSTOWN, OHIO.

CUTTING MACHINE.

Application filed January 13, 1926. Serial No. 81,108.

My invention relates to a cutting machine and, more particularly, to automatic mechanism for cutting and winding a connected series of sanitary toilet or commode seat covers from a continuous ribbon of paper or other suitable material.

The primary object of my invention is the provision of a machine for rapidly cutting and winding seat covers which are connected by perforated portions to facilitate detachment of individual covers.

A further object of my invention is to provide means for removing the waste or unused portions of material from the formed covers before they are wound into a compact roll for subsequent use.

A still further object of my invention is the provision of means for protecting the cutting edges of the forming dies by maintaining them in proper relation to the bed cylinder against which they operate.

Other important features of my invention reside in the means provided for smoothing out and tensioning the ribbon of material as it advances toward the cutting mechanism; the means provided for drawing the ribbon of material through the cutting mechanism; the means provided for preventing wrinkling or damaging of the formed covers after removal of the waste or unused portions of material and the means provided for winding the completed covers into a compact roll.

The various features of my invention are illustrated in the accompanying drawings wherein similar reference numerals designate corresponding parts in the different figures, and wherein—

Figure 1 is a perspective view with parts broken away showing my novel cutting machine and the relation of its various parts;

Figure 2 is a fragmentary rear elevation of the cutting and bed cylinders;

Figure 3 is a side elevation of the cutting machine shown in Figure 1 and showing in dotted lines the material as arranged in the machine during operation;

Figure 4 is an end elevation of the slip collar employed on the winding spindle;

Figure 5 is a fragmentary plan view showing the ribbon of material and the manner in which the connected covers are formed and the unused portions of material removed; and

Figure 6 is a fragmentary plan view showing the driving connections and details of the outer scrap removing devices.

In the drawings, one illustrative embodiment of my invention is shown as comprising a frame 1 supported upon legs 2 which may be provided with brackets 3 having bearing portions 4 for supporting a shaft 5 which, in turn, carries a roll of paper or other suitable material 6 from which the covers are formed. Any material in sheet form may be employed with my cutting machine and I therefore do not desire to limit its application to the cutting of paper.

Rollers or idlers 7, 8 and 9 may be provided for smoothing out and properly tensioning the ribbon of material 10 which is unreeled from the roll 6 and advanced between the bed cylinder 11 and the cooperating cutting cylinder 12, as shown in Figure 3 and more fully described hereinafter. The idlers 7 and 8 may be provided with trunnions 13 which may be suitably journaled in bearings formed in the plates 14, and the idler 9 may be similarly constructed but is preferably journaled in slot bearings 15 to facilitate "threading" of the machine and permit the passes between the rollers 7, 8 and 9 to change responsively to any irregularities in the material, which the idlers will obviously tend to correct as the material advances.

The bed cylinder 11 may be formed with suitable trunnions 16 which may be journaled in bearings 17, as best shown in Figure 1. Obviously the bearings 17 may be designed to permit of vertical and horizontal adjustment of the bed cylinder 11 with respect to the cutting cylinder 12.

The cutting cylinder 12 may be mounted upon a shaft 18 which preferably extends through both sides of the frame 1 and is revolubly journaled in bearings 19, as shown in Figure 1. Adjacent one end the shaft 18 may be provided a gear 20 which meshes with a similar gear 21 mounted upon a power shaft 22 which furnishes power for operating the cutting, stripping and winding apparatus, as more particularly described hereinafter.

Knives or dies 23 and 24 may be removably attached to the face of the cutting cylinder 12 and are designed to form the exterior periphery 25 and the interior periphery 26 of the commode seat covers 27

shown in Figure 5. A transverse cutting knife or die 28 may extend between the outer forming dies 23 at their points of closest proximity, and is preferably provided with a notched or irregular cutting edge 29 to form transverse perforated portions 30 between adjacent covers 27 to facilitate detachment or separation of such covers. The inner cutting die 24 may be provided with extending cutting portions 31 and a transverse cutter 32 to form the flap member 33 of the covers 27 which is intended to extend into the opening of a toilet seat when the covers are being used.

Adjacent its opposite ends the cutting cylinder 12 may be provided with circumferential flanges 34 for properly spacing the bed cylinder 11 from the cutting edges of the dies on the cutting cylinder 12, which should be only close enough to the bed cylinder 11 to properly cut the material without damaging the dies. The cutting cylinder 12 may also carry bands 35 of rubber or other suitable material for frictionally engaging the material and drawing it from roll 6, between rollers 7, 8 and 9 and through the cutting mechanism.

Positioned above the bands 35 and attached to the frame 1 by means of extensions 36 may be provided the straps 37 which extend between the cutting cylinder 12 and the bed cylinder 11 as shown in Figure 3, and on the opposite side of the cutting cylinder 12 they extend downwardly and may be anchored to the tensioning devices 38 to maintain them in contact with the bands 35. The straps 37 function to hold the material against the bands 35 and to thereby assist these bands in drawing the material between the cutting cylinder 12 and the bed cylinder 11. These straps 37 also guide the edge strips of unused material 39 downwardly to assist in detaching them from the formed covers, as shown in Figures 2, 3 and 5. This strap 37 in association with other parts to be described, constitutes the means for removing the unused edge strips 39 from the covers 27 along the previously cut exterior periphery 25.

The members 40, which may be secured to the frame 1 as at 41, extend between the bed cylinder 11 and the cutting cylinder 12 and abut against the outer cutting dies 23 as shown in Figure 2. On the opposite side of the cutting mechanism the members 40 preferably extend upwardly above the lower face of the bed cylinder 11, as shown in Figure 3, and when the formed covers emerge from between the cutting cylinder 12 and the bed cylinder 11 the members 40 exert an upward pressure approximately on the line of cutting of the outer die 23. It will be obvious that the member 40 operates as a straight edge, and in combination with the strap 37 is effective to tear any uncut fibers of material and completely remove the outer unused portion of material 39. The members 40 are resilient and, therefore, move back and forth laterally according to the movement of the outer cutting dies 23 and so are always positioned substantially under the cuts made by these dies and always in operative relation to the cuts in the material.

The mechanism for removing the inner unused portion of material 42 comprises a cylinder 43 which may be journaled in bearings 44 and is preferably formed with a shoe 45, which may be substantially the same shape as the inner unused portion of material 42. The shoe 45 may contact with a roller 46 which is preferably lagged with rubber or some other suitable material and carried by a shaft 47 which may extend through one side of the frame 1. The shaft 47 which carries roller 46, at one end is equipped with a gear 48 which meshes with a similar gear 49 carried by the shaft 50 upon which roller 43 is mounted.

The ratio between gears 48 and 49 is preferably such that the roller 46 operates at a faster speed than the shoe 45 so that when the shoe 45 presses the end of unused portion 42, which is adjacent the flap 33, downwardly in contact with roller 46 it will be effective to jerk or pull the portion 42 from the inner periphery 26 of the covers 27, as shown in Figure 3. Both rollers 46 and 43 are driven from shaft 18 by means of a chain or the like 51 and suitable sprockets 52', and the peripheral speed of shoe 45 on roller 43 is preferably the same as the peripheral speed of the edges of the cutting dies on cutting cylinder 12. Due to the fact that the inner cutting dies do not completely sever the inner unused portions of material from the covers these portions are still in place when the material leaves the cutting mechanism and until removed by the shoe 45 and roller 46. The rubber lagged roll 46 frictionally engages the inner scrap 42 when it is depressed by shoe 45, and because of the fact that it revolves rather faster than the formed covers 27 travel, it operates to jerk or pull the inner scrap 42 from the formed covers 27 along the lines previously cut by the inner cutting dies on the cutting cylinder 12. The rollers 43 and 46 are preferably so spaced from the cutting and bed cylinders that the shoe 45 depresses the end of unused portion 42 against roller 46 just as the last of the cutting along 26 is done by the cutting dies. The shoe 45 may be arranged to depress the unused portion of material 42 at any time after it is cut but the cutting by the inner dies is preferably completed before the unused portion 42 contacts with roller 46.

The formed covers 27, after the inner and outer unused portions of material 42 and 39

have been removed, pass upwardly over the guard 52a, one end of which may be pivoted to the frame 1 as at 53 and the other end of which rests upon the surface of the covers being wound upon the tube or core 54, which may be mounted on winding spindle 55. The purpose of guard 52 is to smooth out the formed covers and prevent them from wrinkling after the scrap portions have been removed as heretofore described. The guard 52a also rests upon the roll of covers being wound and so presses them into place on the roll and produces a compact roll of covers which may be removed from the winding spindle 55 when the roll is of proper size.

The winding spindle 55 may be revolubly supported by a bearing 56 and driven from shaft 18 by means of the chain 51 and a suitable sprocket 58, which at all times maintains the peripheral speed of the spindle 55 and tube or core 54 above the rate of travel of the formed covers. This arrangement keeps the formed covers taut and produces a compact roll upon the tube or core 54 which may be held upon the spindle 55 by means of a slip collar 59 mounted for frictionally opposed rotation on spindle 55.

The collar 59 fits within the tube or core 54, which may be formed with a roughened surface 60 for retaining the tube or core 54. This prevents tearing or separation of the formed covers by permitting some slippage, and the frictional engagement between spindle 55 and collar 59 is sufficient to revolve the collar 59 and core 54 to wind the covers. In other words, the tube or core 54 is held upon collar 59 which slips on the spindle 55 as may be necessary to prevent tearing or separation of the formed covers.

It is believed that the operation of my novel cutting machine is clear from the foregoing description but the principal operations may be repeated as follows: The ribbon of material is unreeled from the roll 6, advanced between the cutting cylinder 12 and the bed cylinder 11, the unused portions of material removed and the completed covers wound upon a core positioned upon the winding spindle 55.

Claims:

1. In a machine of the type described, means for ejecting a central unused portion of material, said means comprising a revoluble shoe and a roll covered with resilient material.

2. In a machine of the type described, means for supporting a roll of material, means for cutting formed articles having openings from said material, means for tensioning the material, and means for removing the inner and outer unused portions of material from said formed articles.

3. In a machine for cutting toilet seat covers having central openings, means for cutting a series of covers, means for removing the unused portions of material from the outer edges thereof, and means for ejecting the central unused portions.

4. In a machine for cutting toilet seat covers having central openings, means for cutting a series of covers from said material, means for tensioning the said material, means for removing the unused portions of material from the outer edges thereof, and means for ejecting the central unused portions.

5. In a machine for cutting toilet seat covers having central openings from a ribbon of material, cutting means embodying opposed die-carrying and bed cylinders, means for removing the unused portions of material from the outer edges thereof, and means for ejecting the central unused portion from the said material.

6. In a machine for cutting toilet seat covers having central openings from a ribbon of material, cutting means embodying opposed cutting and bed cylinders and means for ejecting the central unused portion from the said material embodying a roll and a revoluble shoe adapted to press the central unused portion of material into contact with such roll.

7. In a sanitary toilet seat cover forming machine, the combination of a shaft for supporting a roll of material, opposed cutting and bed cylinders for forming a connected series of covers from a ribbon of material unwound from such roll and perforating the material between adjacent covers, yieldable rings mounted upon the opposite ends of said cutting cylinder, straps for holding the unused edge portions of material against said rings mounted on the opposite ends of said cutting cylinder and means for removing the inner unused portions of material from such covers, said last-named means comprising a rubber covered roll and a revoluble shoe for pressing the inner unused portion of material into contact with such roll.

8. Apparatus for cutting toilet seat covers having central openings from a ribbon of paper comprising a cutting cylinder having dies for cutting the outer peripheries of such covers and dies for cutting the central openings of such covers, a bed cylinder acting in opposition to said cutting cylinder, means for removing the edge portions of unused paper from such covers and means for ejecting the unused paper from the central openings of such covers, said last-named means comprising a revoluble cylinder and a shoe pressing against such cylinder for ejecting the unused portions of material from such central openings.

9. In apparatus for cutting sanitary seat covers having central openings from a ribbon of paper, the combination of a cutting cylinder carrying cutting and perforating

dies, a bed cylinder, circumferential flanges on said cutting cylinder for spacing it from said bed cylinder, rubber rings on said cutting cylinder adjacent such circumferential flanges, straps resiliently held against such rubber rings and operating to direct the edge portions of the ribbon of material downwardly and means comprising a shoe for ejecting the central unused portion.

10. Apparatus for cutting sanitary toilet seat covers having central openings from a ribbon of paper comprising opposed cutting and bed cylinders, means for ejecting the central unused portions, and means for removing the outer unused portions of paper from the formed covers, said last-named means embodying straight edge members and devices for pulling the outer unused portions of paper over said members.

11. In a machine of the type described, means for supporting a roll of material, means for cutting formed articles from said material and means for removing the inner and outer unused portions of material from said formed articles, said means comprising apparatus for changing the direction of movement of said outer unused material, a revoluble roller, and means for pressing said inner unused material against said roller.

In testimony whereof I hereby affix my signature.

BRUCE D. WOOLLEY.