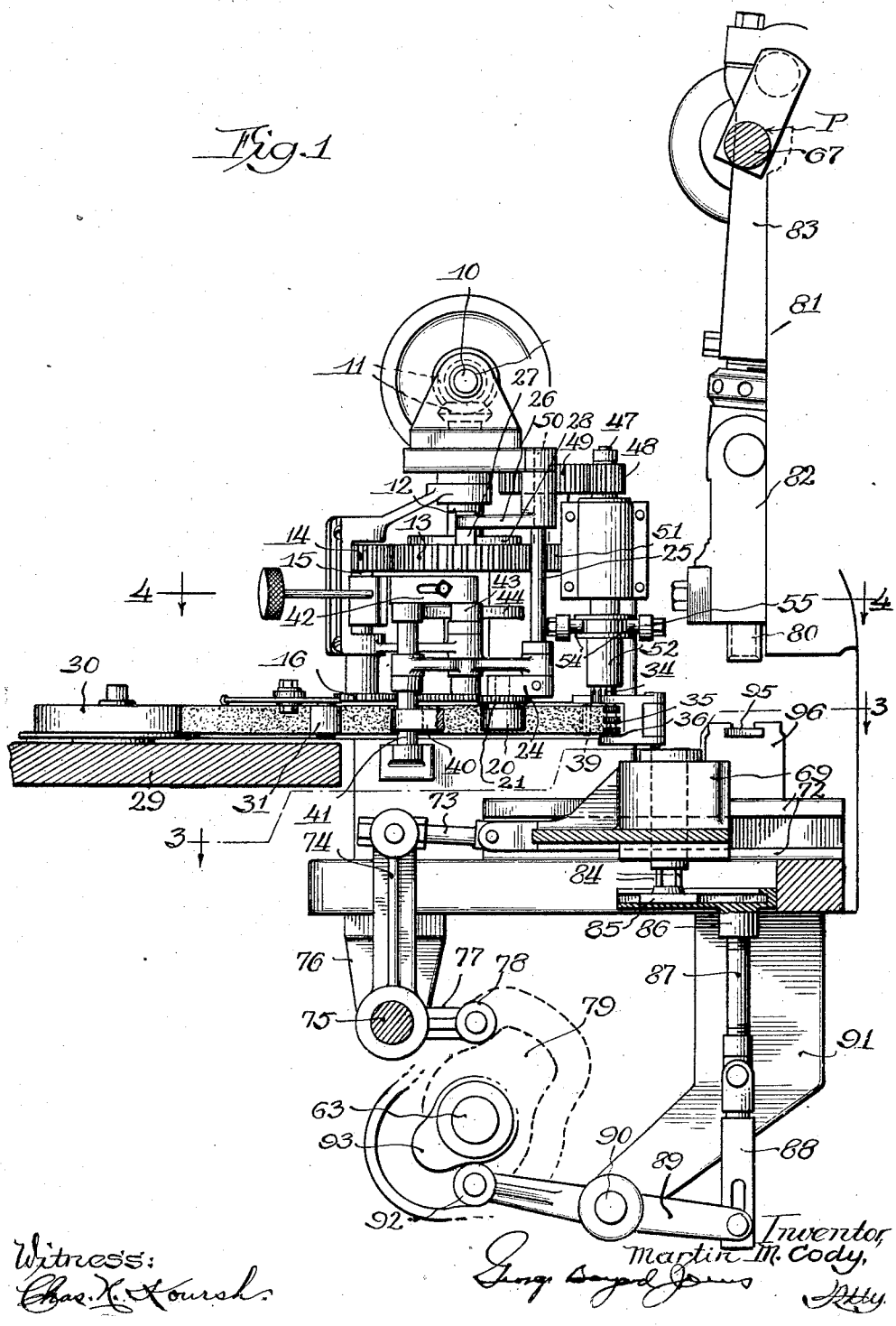
Oct. 25, 1927. 1,646,992

M. M. CODY

PACKING AND PACKING FORMING MACHINE

Filed April 28, 1926 5 Sheets-Sheet 1

Fig. 1



Witness:
Chas. K. Kourse.

Inventor,
Martin M. Cody,
by Geo. Sayford Jones
Atty.

Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/1

Oct. 25, 1927. 1,646,992

M. M. CODY

PACKING AND PACKING FORMING MACHINE

Filed April 28, 1926 5 Sheets-Sheet 2

Fig. 2

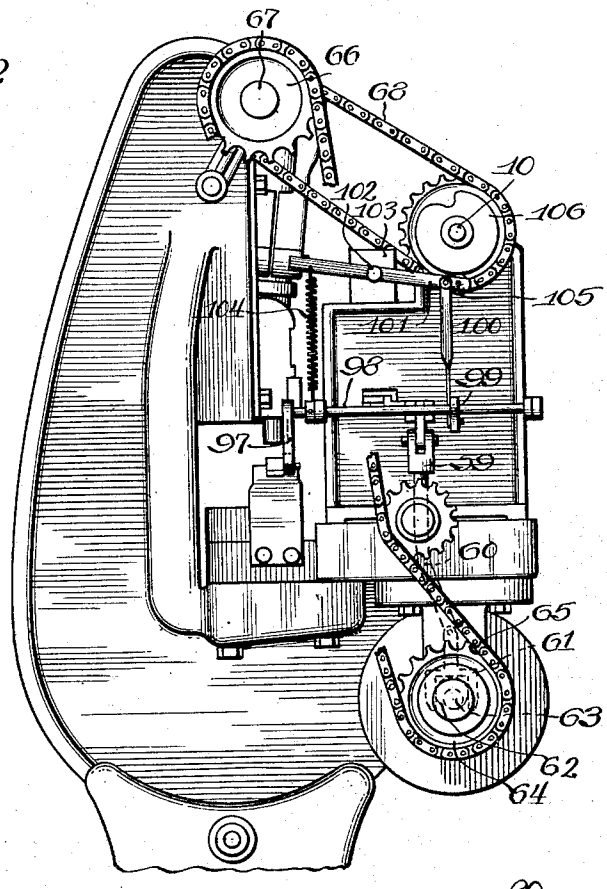
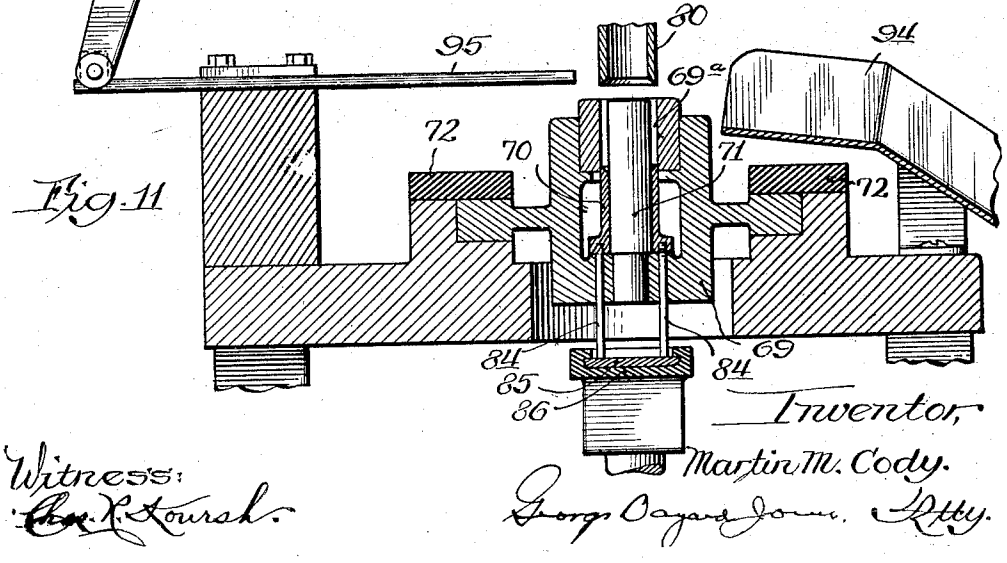


Fig. 11



Witness:
Chas. K. Kourak.

Inventor,
Martin M. Cody.
George Cagard Jones. Atty.

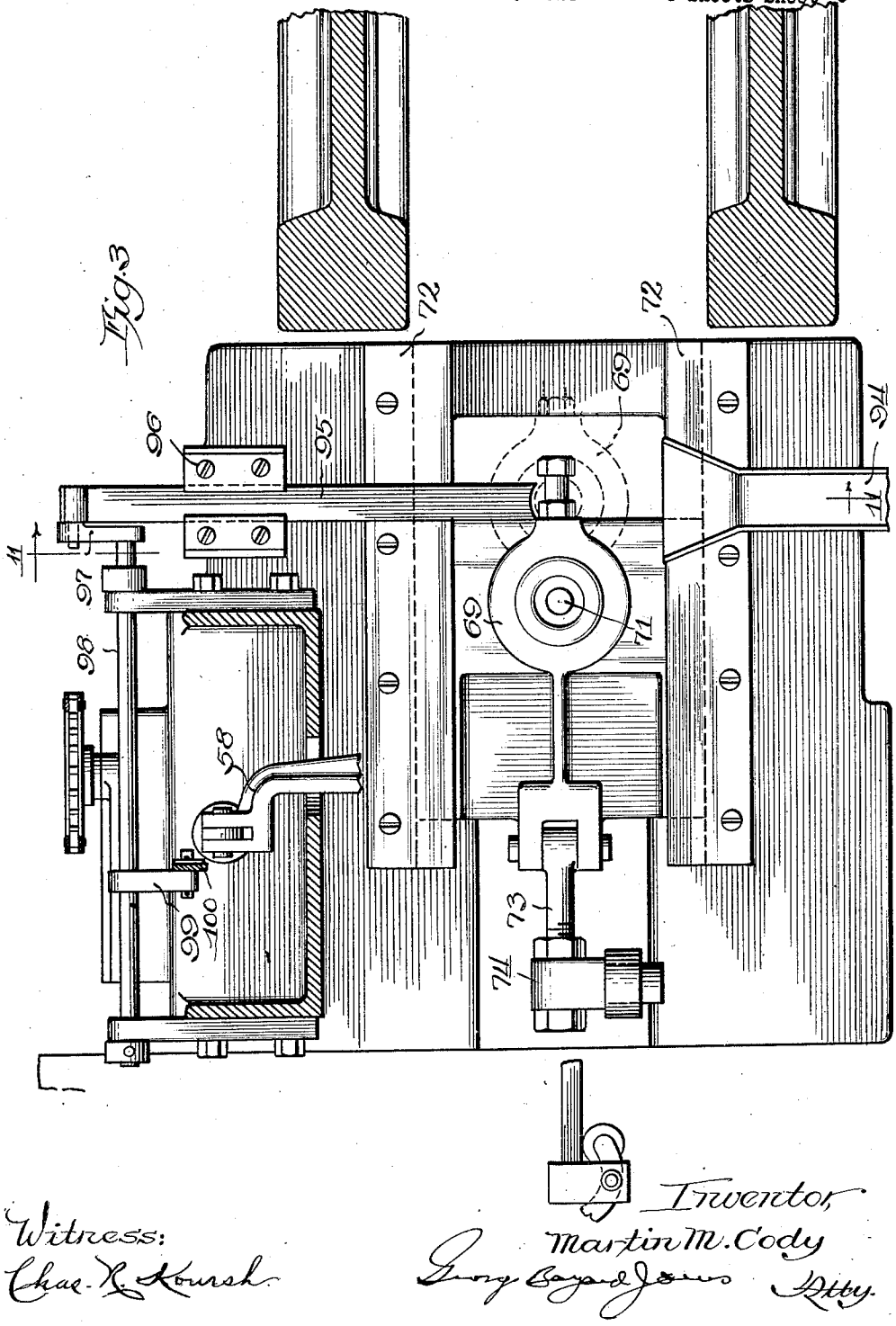
Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/2

Oct. 25, 1927. 1,646,992

M. M. CODY

PACKING AND PACKING FORMING MACHINE

Filed April 28, 1926 5 Sheets-Sheet 3



Witness:
Chas. R. Kourek

Inventor,
Martin M. Cody
by Geo. Gifford Jones Kirby.

Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/3

Oct. 25, 1927. 1,646,992

M. M. CODY

PACKING AND PACKING FORMING MACHINE

Filed April 28, 1926 5 Sheets-Sheet 4

Fig. 4

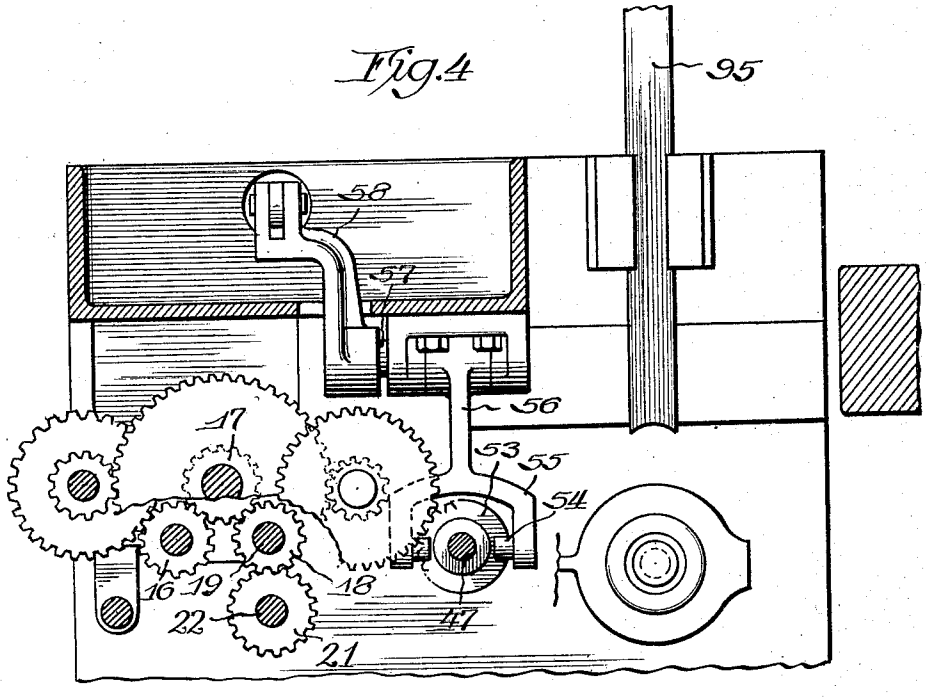
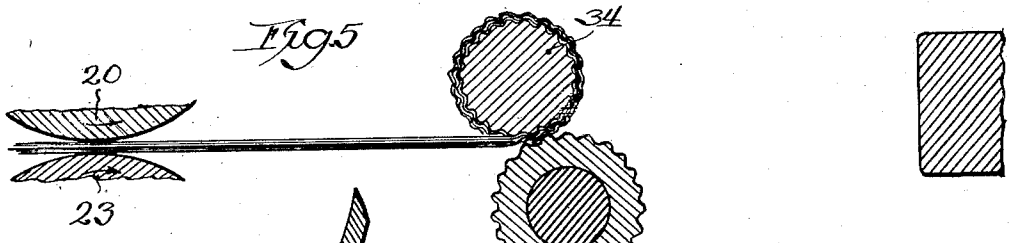


Fig. 5



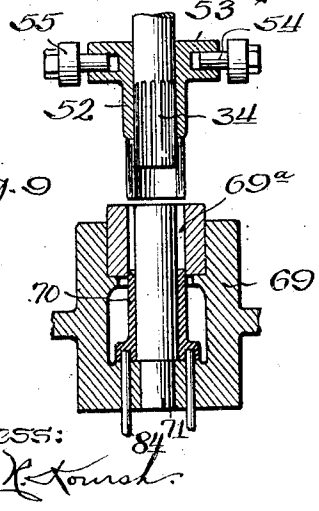


Fig. 9

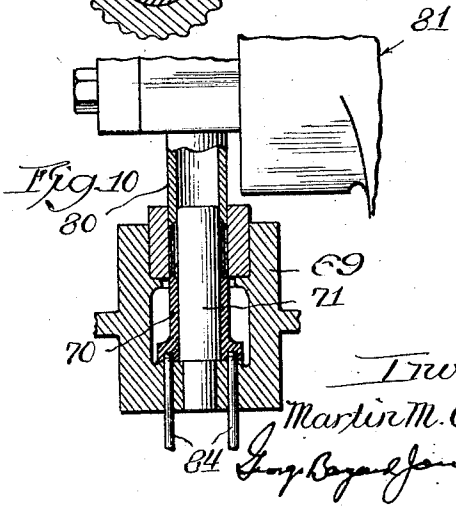


Fig. 10

Witness:
Chas. L. Tousch.

Inventor,
Martin M. Cody.
Geo. Bagnall & Jones Atty.

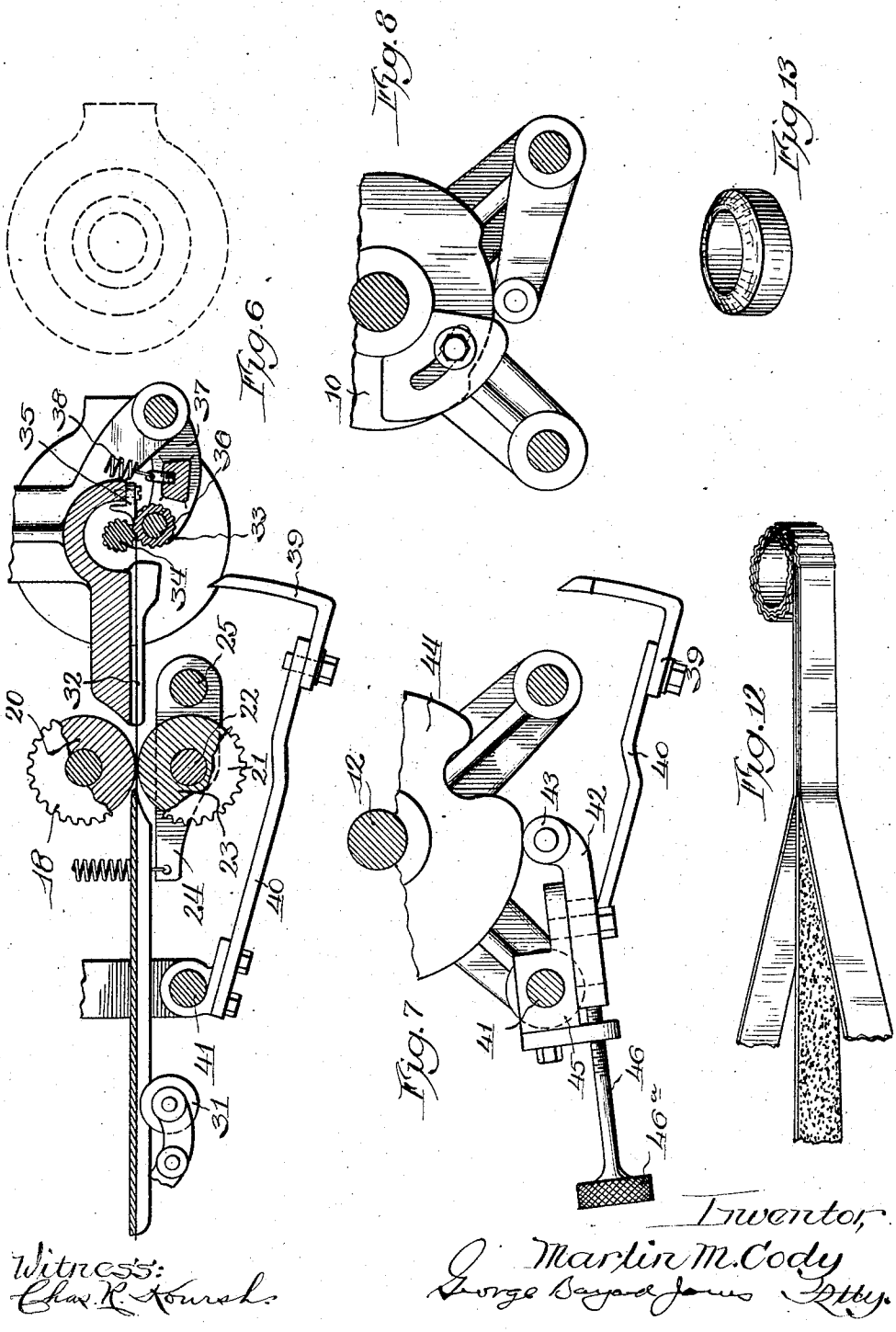
Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/4

Oct. 25, 1927. 1,646,992

M. M. CODY

PACKING AND PACKING FORMING MACHINE

Filed April 28, 1926 5 Sheets-Sheet 5



Patented Oct. 25, 1927. 1,646,992

UNITED STATES PATENT OFFICE.

MARTIN M. CODY, OF CHICAGO, ILLINOIS, ASSIGNOR TO CRANE PACKING COMPANY, A CORPORATION OF ILLINOIS.

PACKING AND PACKING-FORMING MACHINE.

Application filed April 28, 1926. Serial No. 105,143.

This invention relates to improvements in machines for forming packing, and to the packing produced thereby.

The object of the invention is to provide an improvement on the machine disclosed in my co-pending application, Serial No. 730,043, filed August 4, 1924, for automatically forming endless packing rings.

A more specific object is to provide a machine having automatic cut-off means which may be adjusted while the machine is operating to compensate for variations in the thickness of the stock from which the rings are formed.

Another object is to provide improved mechanism for die-pressing the formed rings and thereafter automatically discharging them from the die.

A further object is to provide an improved packing ring.

Other objects relate to various features of construction and arrangement of parts, which will become apparent from a consideration of the following specification and accompanying drawings, wherein

Figure 1 is a front elevation of my improved machine.

Fig. 2 is a rear elevation thereof.

Fig. 3 is a sectional plan view taken approximately on line 3—3, Fig. 1.

Fig. 4 is a sectional plan view taken on line 4—4, Fig. 1.

Fig. 5 is a plan view of the feeding rolls and winding spindles.

Fig. 6 is a horizontal sectional detail view showing the cut-off mechanism.

Fig. 7 is a horizontal sectional view showing the cam mechanism and adjusting means for operating the cut-off device.

Fig. 8 is a detail view showing the cam mechanism for controlling the feeding rollers.

Fig. 9 is a broken detailed vertical sectional view of the stripper.

Fig. 10 is a detail view of the die-pressing apparatus.

Fig. 11 illustrates the means for lifting the completed packing ring from the die and the discharge mechanism associated therewith.

Fig. 12 illustrates the relative arrangement of the strips of material from which the packing ring is formed.

Fig. 13 is a perspective view of a ring after being die-pressed and discharged from the machine.

The invention is characterized by the provision of means for winding a strip or strips of material, such as lead foil, into a packing ring, automatically interrupting the feeding of the foil at the proper time and actuating a cut-off mechanism to sever the material of the ring, thereafter stripping the ring from its spindle and inserting the same into a suitable die, pressing the same by suitable punch press mechanism to compress the ring and give it the proper internal structure and external size and shape, and thereafter discharging the formed ring from the die into a delivery chute, or the like.

Power is applied from any suitable source to shaft 10, which, through bevel gears 11, 11, drives vertical shaft 12 upon which is mounted the large gear 13 which meshes with pinion 14 mounted on shaft 15 carrying on its lower end gear 16, one of a train of gears. The gear train is best illustrated in Fig. 4 and comprises, in addition to the gear 16 mentioned, a gear 17 in mesh therewith which also meshes with the gear 18 mounted on the shaft 19 which carries one of the feed rolls 20. Gear 18 meshes with pinion 21 which is mounted on shaft 22 on the lower end of which shaft is mounted a second feed roll 23. The shaft 22 is mounted in arm 24 which is non-rotatably secured to the lower end of shaft 25. To the upper end of shaft 25 is secured the arm 26 carrying roller 27, which co-operates with cam 28 mounted above gear 13 on shaft 12. It will be seen that when the roller 27 is moved by the re-entrant cam surface of cam 28 through arm 26, it will rock shaft 25 and arm 24, thereby moving the feed rollers 23 counter-clockwise, as viewed in Fig. 6, thus interrupting the feeding of the material to the rotating spindle, hereinafter referred to.

A table or support 29 is provided, upon which may be mounted one, or preferably two rolls of foil and an intermediate roll of paper, which latter has been treated previously with a lubricant, such as tallow and graphite. One of the rolls of foil is indicated at 30, in Fig. 1. The three strips of material are passed in contact with the tension roller 31, between the feed rollers 20

Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/6

and 23, through guide 32 between the fluted rollers 33 and 34, around the latter of which the material is wound. The rollers 33 and 34 tend to mesh sufficiently to cause the material to be depressed into the corrugations of the roller 34. Roller 33 is positioned somewhat beyond roller 34, as shown in Figs. 5 and 6. A guide 35 is positioned adjacent and beyond the roller 34, and has a curved surface, as shown in Fig. 6, which turns the free end of the strips of material over into contact with the corrugations of the roller, whereby the roller upon rotation will cause the said free end to be carried around the roller and wrapped upon itself, as will be seen. The roller 33 is mounted on a shaft 36 carried by pivoted arm 37 which is moved to the left, as viewed in Fig. 6, by a spring 38. This construction permits relative lateral movement of the rollers 33 and 34 as the size of the packing ring increases and, at the same time, provides sufficient pressure for forming uniform rings.

The cut-off mechanism comprises a knife 39 carried on arm 40 which is secured to a vertical shaft 41. To the upper end of shaft 41 is secured arm 42 carrying a cam roller 43 on its free end, which roller coacts with cam 44 secured to shaft 12. When the roller 43 drops into the depression in the cam 44, knife 39 will be moved about the shaft 41 as a pivot, in counter-clockwise direction, as viewed in Fig. 6, to sever the strips of material, as will be clearly understood. The arm 42 is adjustably secured to a block 45, as shown in Fig. 7, whereby rotation of the threaded stem 46 by means of its knurled head 46^a will adjust the roller 43 for co-ordinating the actuation of the knife 39 with reference to the other steps in the forming of the rings.

It will be seen that the thickness of the ring depends on the length of the strips of material which are cut off. When this material is of uniform thickness, the finished rings will all be of the same thickness, other conditions remaining the same. However, in practice, it develops that the thickness of the stock varies considerably, particularly the thickness of the metal foil, and therefore the finished rings would not be uniform unless the amount of material of which they are composed can be varied. Another variation is caused by the coating on the strip of paper, which if partially dry due to an interruption in the operation of the machine, will be thicker than when the machine is operating continuously. In either case, the operator may compensate for these irregularities and insure substantial uniformity in the product by varying the length of the strips which make up the spiral rolls. This adjustment may be made by turning the knurled head 46^a while the machine is operating.

The spindle 34 is secured to, or integrally formed with a vertical shaft 47 to the upper end of which is secured a gear 48 which meshes with gear 49 carried on a shaft 50 which is driven by gear 51 in mesh with the large gear 13. The size or diameter of the packing rings is determined by the ratio of the gears 48 and 49, said gears being readily detachable from the shafts 47 and 50, respectively, whereby other gears of different ratios may be substituted when rings of different sizes are desired to be formed.

After the cut-off mechanism has been actuated, as above described, the packing ring is stripped from the spindle by means of a stripper sleeve 52 having at its upper edges a pair of spaced horizontal flanges 53, within which slide the studs 54 carried by the yoke shaped member 55. The yoke has an arm 56 which is secured to a shaft 57 secured to lever 58 which is suitably connected by means of a head 59 and link 60 to the member 61 which coacts with cam 62 mounted on shaft 63, which is positioned adjacent the lower portion of the machine. It will be seen when the member 61 is lifted vertically, as shown in Fig. 2, that such motion will be transmitted by means of link 60, head 59, lever 58, shaft 57 and arm 56 to yoke 55, whereby the stripper sleeve will be moved downwardly sufficiently to slide the packing ring from the spindle 34. The shaft 63 has mounted thereon a sprocket wheel 64 by means of which and the chain 65 said shaft is driven from the sprocket 66 carried on shaft 67. A chain 68 forms the driving connection between shaft 67 and shaft 10, as shown in Fig. 2.

As above mentioned, the downward movement of stripper sleeve 52 moves the formed packing ring into the die 69 which, by means hereinafter described, will be concentrically positioned immediately below the spindle 34 during the stripping operation. The die 69 has a vertical opening corresponding to the size of the packing being made, and in the lower portion of the opening is mounted a discharge sleeve 70. Concentrically mounted in the opening of the die is a stud 71 around which, into the circumferential opening, the packing ring is forced by the stripper sleeve 52. (See Fig. 9.)

The die 69 is mounted in guideways 72 within which the die can be horizontally reciprocated. As shown in Fig. 1, the die frame is connected by link 73 to arm 74, which is pivoted, at 75, to the depending brackets 76. Arm 74 is formed as a bell-crank lever, the short arm 77 of which is provided with a roller 78, or the like, which coacts with the box cam 79 carried on previously mentioned shaft 63. It will be seen that as shaft 63 rotates, cam 79 will, through the mechanism of the bell-crank 73, cause a reciprocation of the die member 69. The

cam 79 is so arranged and timed that the die 69 will be immediately below the spindle 34 when the stripper sleeve 52 moves downwardly. When the packing ring has been forced into the die chamber, around stud 71 by the stripper sleeve 52, the cam 79 will cause the die 69 to move to the right, as viewed in Fig. 1, to a position immediately below the plunger 80 of the punch press, which is indicated, generally, by 81. (See Fig. 10.)

The punch press 81 may be of standard construction and need not be explained in detail. It will suffice to state that the plunger 80 is actuated by connecting members 82 and 83 from the shaft 67. The actuation of the press is so timed that when the die 69, which in Fig. 1 is shown in the intermediate position, has been moved into alinement with the plunger 80, said plunger, which is of the sleeve type, will be forced down upon the packing in the die chamber, which is indicated by numeral 69a. This action of the plunger compresses the packing, giving it the desired shape and size, and in reducing the length thereof tends to plait the layers of the same, as will be clear. After the plunger 80 has been retracted from the die, the completed packing ring will be forced upwardly from the die chamber 69a by means of previously mentioned discharge sleeve 70. This sleeve 70 is reciprocable vertically in the die chamber by means of the rods 84, which pass through suitable openings in the base of the die member 69. The rods 84 are secured at their lower ends to the plate 85 which is horizontally slidable in the head 86 carried by rod 87 which is connected by a link 88 to the lever 89, pivoted at 90, to the depending bracket 91. The opposite end of lever 89 carries a roller 92 which coacts with the second box cam 93 mounted on shaft 63. Rotation of shaft 63 by means of cam 93 will actuate lever 89 to lift the shaft 87 and head 86 and cause the rods 84 to move the discharge or extracting sleeve 70 upwardly, whereby the packing will be moved out of the die chamber 69a. When the packing has thus been extracted, it is kicked into a discharge chute 94 by means of a reciprocating bar 95. The bar 95 slides through a suitable guide 96, and at its rear end is pivoted to the arm 97, mounted on rock shaft 98, which is suitably journaled in the frame of the machine. The shaft 98 has secured thereto a second arm 99 pivoted to link 100, which in turn is pivotally connected to lever 101. This lever 101 is pivoted at 102 to a suitable support 103 carried by the frame of the device, and at its rear end is attached to a spring 104 which tends to move the lever in a counter-clockwise direction, as viewed in Fig. 2. The opposite end of the lever 101 carries a roller 105 which bears against the cam 106 mounted on shaft 10. It will be seen that when the shaft 10 rotates to bring the cam depression into position where the spring 104 can actuate the lever from the position shown in Fig. 2, that link 100 will move upwardly and carry with it the arm 99, thereby causing shaft 98 to rock. Shaft 98 will cause the arm 97 to move the kick-off bar 95 to the right, as viewed in Fig. 3, whereby the finished packing ring will fall into the discharge chute 94 and from the same into a suitable receptacle. It will be seen that the machine being timed in such manner that the various steps above described take place in proper sequence, the manufacture of endless packing rings can very expeditiously be carried out and with minimum attention.

The packing itself is composed of material which has been bent back and forth while it is being wound as a spiral, and which when compressed axially in the die afterwards, is compressed back and forth in a direction at right angles to its initial back and forth movement. This construction insures ready further compressibility endwise and inward and outward radial expansibility. These characteristics are important when the packing is installed, as in the case of condenser tube packing for example, where it is necessary to expand the packing to insure an air tight sliding joint without deforming the tube, or causing what is known as "necking". Such condenser packings are tightened initially by a caulking tool, using comparatively light blows, and may be held in place by a screw-threaded ferrule which will cause further endwise compression of the packing, resulting in a tendency to lateral expansion, although in some cases the ferrules are dispensed with.

Although I have shown one embodiment of my improvements for the purposes of illustration, it will be apparent that various changes may be made without departing from the spirit of my invention, and I do not wish therefore to be restricted to the embodiment herein shown and described, except where limitations thereto appear in the appended claims.

What I claim is:

1. A machine for forming packing rings comprising a rotatable spindle upon which the packing material is wound, a cut-off device timed to sever the material when the formed packing ring is of the desired size, a die, means for stripping said ring from said spindle and inserting the same in said die, a press adapted to compress said ring in said die, means for extracting the compressed ring from the die, and means for delivering said ring to a discharge chute.

2. A machine for forming packing rings comprising a spindle upon which the packing material is wound, a cutoff device associated therewith comprising a cam controlled

blade for severing said packing material at predetermined intervals, means for compressing the formed ring axially to reduce it to predetermined size and shape, and means for removing the compressed ring automatically from the machine.

3. A machine for forming packing rings comprising mechanism for forming rings of strips of material, means for severing said material at predetermined intervals, said means comprising a pivoted blade, a cam, a cam actuated arm for actuating said blade, adjusting means for coordinating the cutoff means with said forming mechanism, means for compressing the formed ring axially to reduce it to predetermined size and shape, and means for removing the compressed ring automatically from the machine.

4. A machine for forming packing rings comprising mechanism for forming rings of strips of material, means for severing said material at predetermined intervals, said means comprising a pivoted blade, a cam, a cam actuated arm for actuating said blade, adjusting means for coordinating the cutoff means with said forming mechanism, said adjusting means comprising a threaded member engaging said arm, means for compressing the formed ring axially to reduce it to predetermined size and shape, and means for removing the compressed ring automatically from the machine.

5. A machine for forming packing rings comprising a spindle upon which the packing material is wound, a cut-off device associated therewith comprising a blade, a rocker shaft upon which said blade is mounted, a head secured to said shaft and movable therewith, a cam, a cam actuated arm operatively secured to said head, a threaded member for adjusting said arm relatively to said head, means for compressing the formed ring axially to reduce it to predetermined size and shape, and means for removing the compressed ring automatically from the machine.

6. A machine for forming packing rings comprising a spindle upon which the packing material is wound, a cut-off device associated therewith comprising a blade, a rocker shaft upon which said blade is mounted, a head secured to said shaft and movable therewith, a cam, a cam actuated arm operatively secured to said head, a threaded member for adjusting said arm relatively to said head, means for locking said arm and head in adjusted relation, means for compressing the formed ring axially to reduce it to predetermined size and shape, and means for removing the compressed ring automatically from the machine.

7. A machine for forming packing rings comprising rotatable forming means, a die, mechanism for stripping said ring from the forming means and inserting the same in said die, said die comprising an annular chamber, a press for compressing the ring in said chamber, and means for ejecting the compressed ring from said chamber.

8. Mechanism for treating packing rings, comprising a die having an annular chamber into which said rings are adapted to be inserted, means for compressing a ring in said chamber, and means for ejecting the compressed ring therefrom in a direction opposite to the direction of insertion, said means comprising an annular sleeve slidable into said chamber.

9. Apparatus of the class described comprising a packing ring forming member, a stripper, a die, means for actuating said stripper for removing the ring from said forming member and inserting the same in said die, means for compressing the ring within said die, and means for ejecting the ring from the die in a direction opposite to the direction of insertion.

10. Apparatus of the class described comprising a packing ring forming means, a reciprocable die, means for stripping a ring from said forming means and inserting it in said die, and means for reciprocating said die from ring receiving to compressing positions, and vice versa, in timed relation with respect to the actuation of said stripping and compressing means.

11. Apparatus of the class described comprising a packing ring forming means, a reciprocable die, means for stripping a ring from said forming means and inserting it in said die, means for reciprocating said die from ring receiving to compressing positions, and vice versa, in timed relation with respect to the actuation of said stripping and compressing means, and means for extracting the compressed ring from the die.

12. Apparatus of the class described comprising a packing ring forming means, a reciprocable die, means for stripping a ring from said forming means and inserting it in said die, means for reciprocating said die from ring receiving to compressing positions, and vice versa, in time relation with respect to the actuation of said stripping and compressing means, and means for extracting the compressed ring from the die, said extracting means supporting the base of the ring during the compressing thereof.

13. Apparatus of the class described comprising ring forming means, a die having an annular chamber, means for stripping the ring from the forming means and inserting it in said chamber, means for compressing the ring in said chamber, and a member forming the bottom of said chamber during the compressing operation and being slidable axially in the chamber for removing the compressed ring therefrom.

14. Apparatus of the class described com-

prising ring winding means, a reciprocable die having an annular chamber therein, a stripper for removing the wound ring from said winding means and inserting it in said die, means for compressing the ring in said chamber, an extracting member reciprocable with said die and movable longitudinally of said chamber for removing the compressed ring therefrom, means for reciprocating said die in timed relation from ring receiving to compressing positions, and vice versa, and means for actuating said extracting member, said last named means and member having engaging portions that are relatively slidable during the reciprocation of said die.

In testimony whereof, I have subscribed my name.

MARTIN M. CODY.

Published by AsbestosClaims.Law
asbestosclaims.law/library/23289/10