

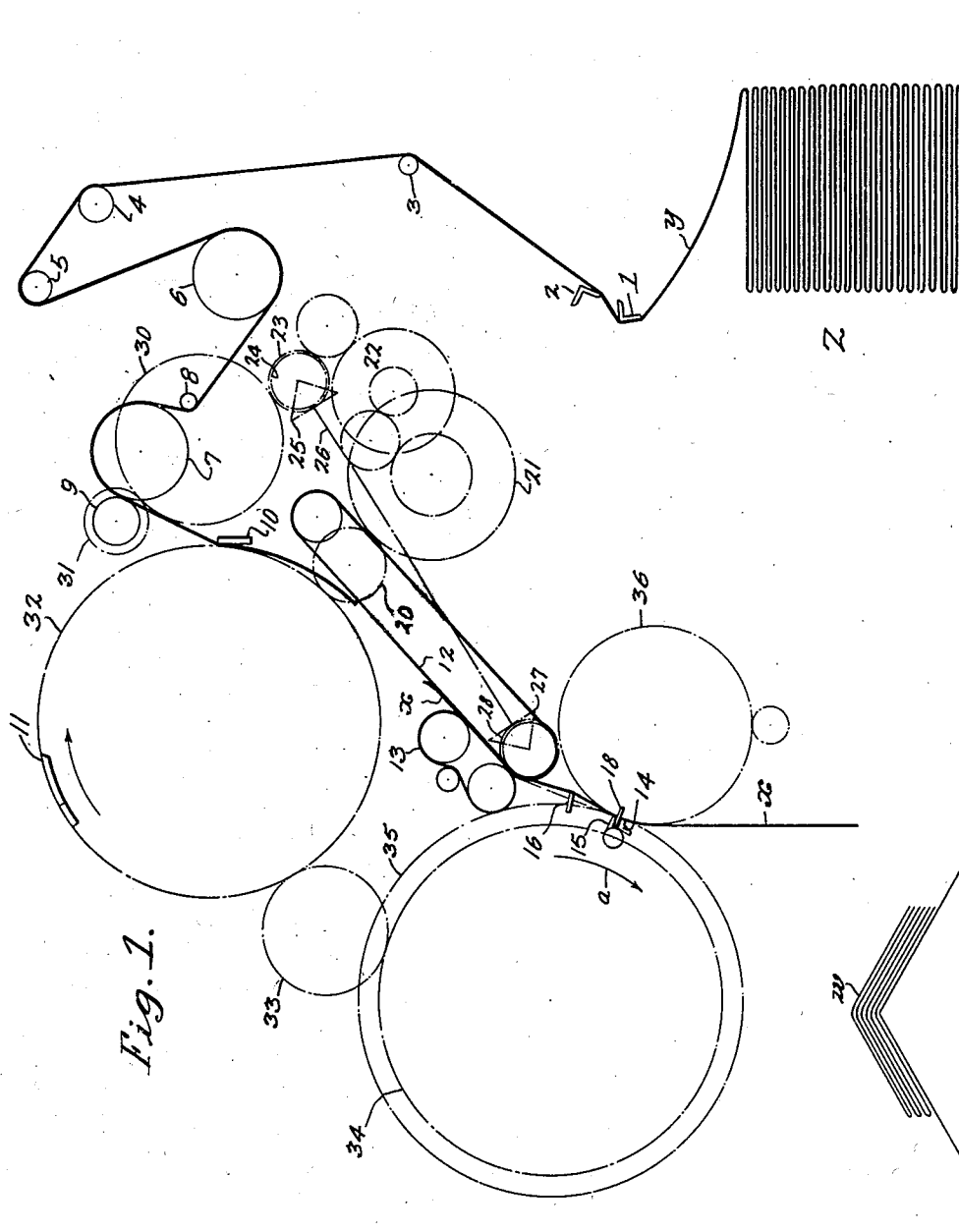
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FEEDING MECHANISM FOR CUTTING AND FOLDING MACHINES

Original Filed July 27, 1925 3 Sheets-Sheet 1



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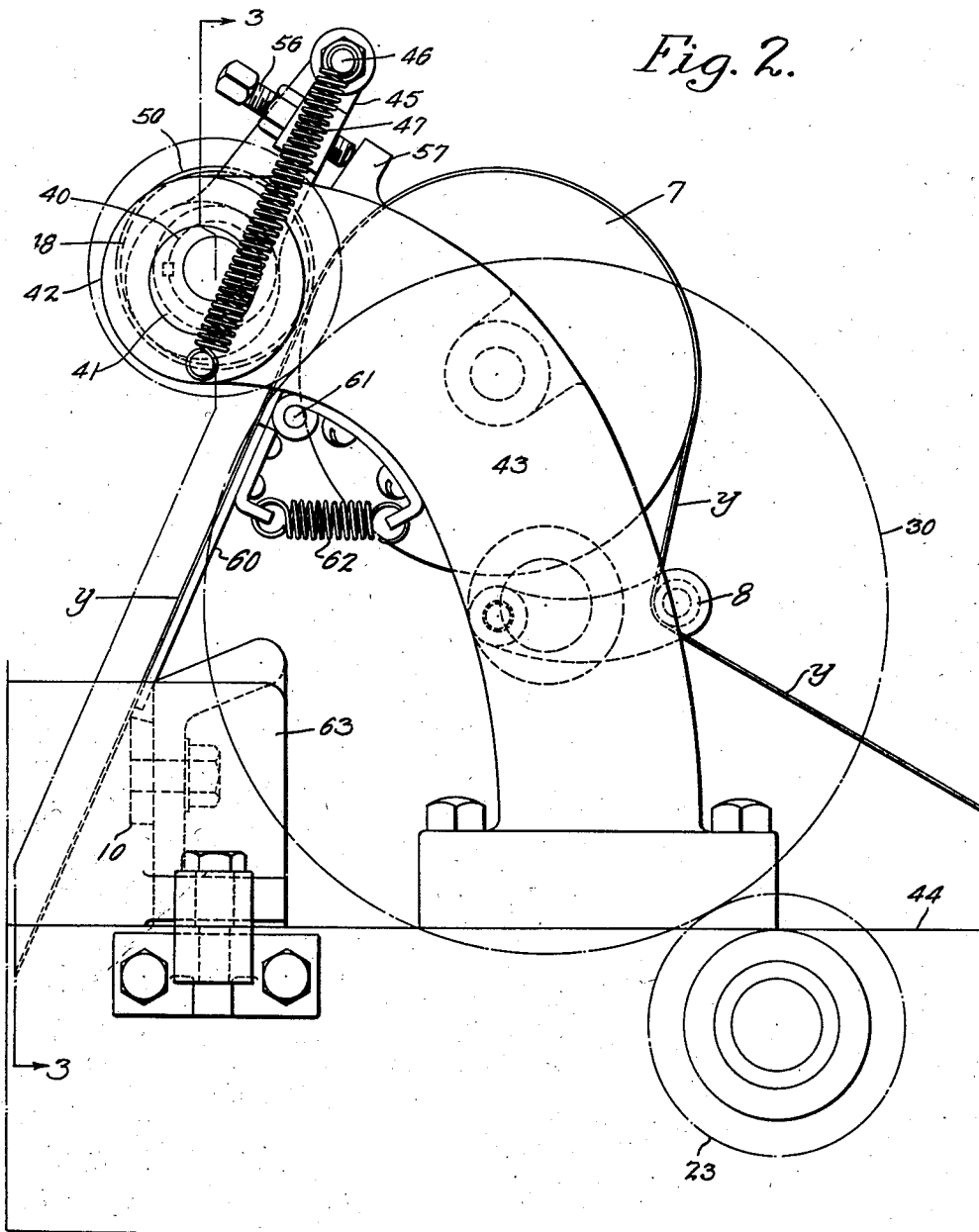
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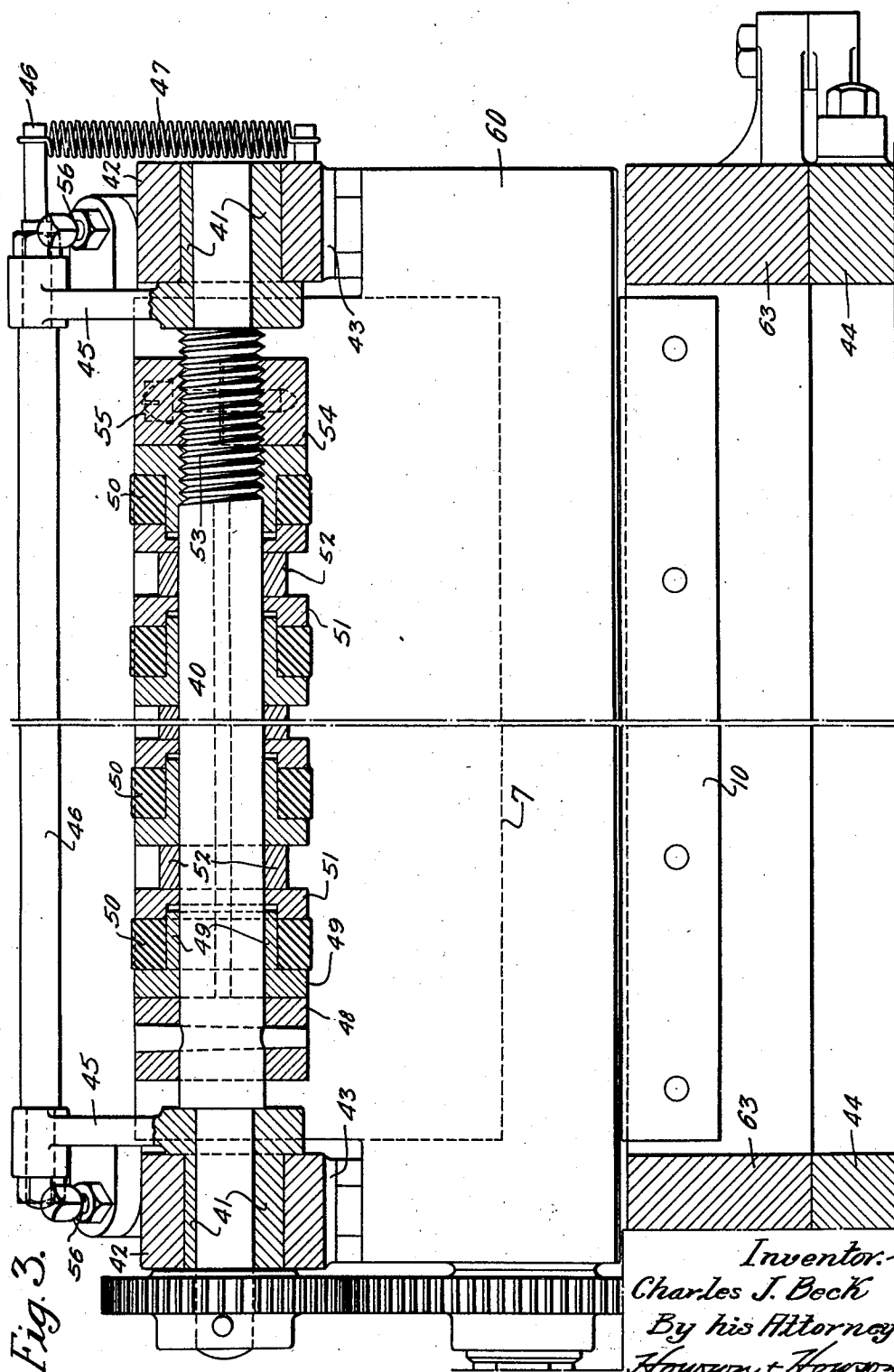
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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR CUTTING AND FOLDING MACHINES

Original application filed July 27, 1925, Serial No. 46,342. Divided and this application filed April 27, 1929. Serial No. 358,526.

This invention relates to feeding mechanism for machines which are adapted to cut and fold fabrics of the class of which bags of various descriptions are made, including heavy burlap potato sacks and fine cheese cloth interlinings for sugar sacks.

The present application is a division of my copending application Serial No. 46,342, filed July 27, 1925.

10 The object of the present invention is to provide a compact and efficient mechanism which will be capable of accurately feeding fabrics of the class noted to the cutting and folding mechanisms of the machine.

15 Referring to the drawings:

Figure 1 is a diagrammatic side elevation of the general arrangement of the elements of which the machine is composed:

Fig. 2 is a side elevation of the feeding unit; and

Fig. 3 is a transverse sectional view, taken on the line 3—3, Fig. 2.

Fabric such as burlap, of which many commercial containers are made, is a very difficult material to handle by machinery, due to its unreliable quality. It is usually packed in bales for shipment under a heavy hydraulic pressure which causes the folds to adhere to each other, causing considerable difficulty in feeding an automatic machine designed to operate upon it.

In Fig. 1 of the drawings, I have illustrated at *z* a bale of burlap, or other fabric of the same general character, the web *y* of which is passing through a machine made in accordance with my invention, being cut into sheets *x* and finally folded as at *w* and stacked for removal from the machine to be stitched or otherwise formed into bags, or otherwise converted for use.

The web *y* in leaving the bale *z* is passed under and between loosening bars 1 and 2 which may be supported in any suitable manner. The knife-like edges of the bars 1 and 2 separate any folds of the fabric that may adhere to the web *y* as it passes into the machine.

From the straightening bars 1 and 2 the web *y* passes over guide rolls or bars 3, 4 and 5, all of which tend to cause a resistance to the

passage of the web. From the roll 5 the web passes under a roll 6 whose surface is roughened by coating it with granulated material such as emery or the like suitably secured to the surface of the roll by cement or like substance.

From the rough roll 6 the web passes to and over a smooth roll 7, a floating bar or roll 8 being interposed between the rolls 6 and 7 for the purpose of maintaining firm contact between the web and the surfaces of said rolls.

A power driven feed roll 9 engages the web *y*, gripping it between itself and the smooth roll 7, and serves to pull the fabric from the bale and feed it to the cutting unit.

The cutting unit comprises primarily a fixed blade 10 and a revolving blade 11. Upon the speed at which the feed roll 9 travels depends the length of the sheet to be cut.

After cutting, the sheet *x* drops upon a conveyer 12 and is directed to the folding unit, an upper belt 13 overlying and engaging the conveyer 12 to assist in the delivery of the sheet to the folding unit.

The folding unit comprises a fixed jaw 14 secured to a revolving reel and a co-operating movable jaw 15 suitably mounted in said reel. Also in the reel is an adjustable blade 16 whose function is to square the sides of the sheet *x* with respect to the jaw 14 before the jaw 15 actually contacts therewith, as will be more fully described hereinafter, to complete the folding operation.

In order to insure a positive grip of the fabric sheet *x* between the jaws 14 and 15, a second revolving reel or cylinder is mounted adjacent the folding reel and is provided with a pivoted creasing blade 18 which projects beyond the periphery of the cylinder and functions to force the sheet between the said jaws. As the surfaces of the two reels recede, due to their circular movement in opposite directions, the blade 18 is withdrawn, leaving the sheet firmly gripped between the jaws.

The folding reel carries the sheet, in the direction of the arrow (*a*), Fig. 1, and at a predetermined point of the revolution the

jaw 15 is released from the jaw 14, permitting the folded sheet to fall on a stacker platform as at *w*.

It will be understood that the several units are power driven and timed in such a manner as to feed the desired length of fabric to the cutting unit and at the proper time sever the sheet *x* from the web *y*. The conveyer 12 is so timed with the cutting mechanism as to receive the sheet and deliver it to the folding unit in such a manner as to permit the jaws 14 and 15 to grip the sheet at its centre in order that the sheet may be folded evenly.

Power is supplied to the machine, from a suitable source (not shown) through a pinion 20 which meshes with a gear 21 from which a suitable train 22 of interchangeable gears is driven. Meshing with the end gear of the train of gears 22 is a gear 23, to which is secured a mitre gear 24 which, meshing with a second mitre gear 25, drives a shaft 26, to the opposite end of which is secured a mitre gear 27 which meshes with a mitre gear 28, secured to one end of the main drive-shaft of the conveyer 12.

The gear 23 drives an intermediate gear 30 which in turn drives a gear 31 secured to the shaft of the feed roll 9.

The pinion 20 also drives a gear 32 which serves to rotate the revolving knife blade 11, and the gear 32 drives an intermediate gear 33 which in turn meshes with a gear 34 which functions to rotate the folding reel. Adjustably carried by the said folding reel and driven therewith is a second gear 35 which meshes with a gear 36 by which the inserting blade 18 is rotated.

It will be noted that the revolving knife blade 11 and the folding jaws 14—15 are geared in such relation as to receive rotary motion at equal speeds.

The feed roll 9 is constructed as clearly shown in Figs. 2 and 3 of the drawings, and comprises a spindle 40 journaled in eccentric bushings 41, 41 which in turn are journaled in heads 42, 42 on brackets 43, 43 secured to the side frames 44, 44 of the machine proper. Each of the eccentric bushings 41 is provided with an arm 45, which are connected transversely at their outer ends by a bar 46. To one end of the bar 46 is secured one end of a spring 47, the opposite end of which is secured to one of the brackets 43, the purpose being to keep the surfaces of the roll 9 always in firm contact with the surface of the roll 7, the fabric web *y* lying therebetween.

At one end of the spindle 40 is secured a collar 48. Adjacent the collar 48 and splined to the spindle 40 is a flanged sleeve 49 on which is mounted a rubber or other flexible tire 50. Adjacent the tire 50 and recessed to receive the end of the sleeve 49 is a disc 51. The elements 49, 50 and 51 comprise a section, of the feed roll 9, which is duplicated throughout the length of the spindle 40, filling

collars 52 being interposed between the sections as shown in Fig. 3.

Adjacent the end of the spindle 40 opposite the collar 41, the said spindle is threaded as at 53, to receive an adjusting collar 54. The collar 54 is split and is provided with a lock screw 55.

Should a slight increase or decrease in the diameter of the feed roll 9 become necessary to feed a slight amount, more or less, of the fabric to the cutting blades, the collar 54 if turned clockwise will compress the rubber tires 50 to such an extent that, due to the inner face and side walls being confined, the outer face of the tire will be expanded, thereby increasing the diameter and the peripheral speed of the feed roll 9. A counterclockwise movement of the collar 54 will act in the reverse to that just described.

Limit screws 56, 56 are provided on the levers 45, 45 and engage lugs 57, 57 on the brackets 43, 43, to limit the inward movement of the feed roll 9 toward the roll 7.

The rough roll 6 functions to maintain an even tension upon the web *y* throughout its entire width so that it will not sag at the spaces between the points where the tires 50 of the feed roll 9 engage the fabric and the roll 7.

An apron 60 is pivoted to the brackets 43, 43 at 61, 61 for the purpose of guiding the web to and over the fixed knife blade 10, which is adjustably mounted in a frame 63, secured to the side frames 44 of the machine. A spring 62 tends to keep the apron in contact with the cutter frame 63 which maintains the lower edge to said apron just above the fixed knife blade 10.

I claim:

1. In a cutting and folding machine, a feeding unit comprising a tension roll having a roughened surface whereby the material passing through said feeding unit may be maintained at a uniform tension throughout its entire width.

2. In a cutting and folding machine, means for feeding material to the said machine in a single ply web under a uniform tension throughout its entire width, comprising a bar having relatively sharp edges over which the web is adapted to pass from a source of supply, a roll having a roughened surface around which the web is adapted to pass, and a pair of rolls adapted to grip the web between their peripheries and thereby draw the web from the said source of supply.

3. In a cutting and folding machine, a feeding unit comprising a roll having a fixed diameter, a variable diameter roll having a face composed of resilient material co-operating with the face of said fixed diameter roll to feed a web of material therebetween, means tending to move said rolls into contact with each other, and means for regulating the extent of said relative movement to prevent

flattening of the resilient face of expandible roll against the face of the fixed diameter roll.

4. In a cutting and folding machine, a feeding unit comprising a roll having a fixed diameter, a roll having a variable diameter co-operating therewith to feed a web of material therebetween, said variable diameter roll comprising a shaft, a series of sleeves mounted on said shaft, a flange on one end of each sleeve, a disc mounted on said shaft at the opposite end of each sleeve and recessed to receive the said sleeve end, a series of resilient rings on said sleeves intermediate said flanges and said discs respectively, and means for compressing said assemblage in a direction longitudinally of the shaft to cause an expansion of said rings radially of said shaft.

5. In a cutting and folding machine, means for feeding a web of material into said machine, comprising a pair of spaced brackets, a roll having a fixed diameter rotatably mounted in said brackets, a roll having a variable diameter co-operating with said fixed diameter roll, a pair of bushings rotatably mounted in said brackets and having eccentric bearings adapted to rotatably support said variable diameter roll, and means tending to rotate said bushings in said brackets to move the variable diameter roll toward the fixed diameter roll.

6. In a cutting and folding machine, means for feeding a web of material into said machine, comprising a pair of spaced brackets, a roll having a fixed diameter rotatably mounted in said brackets, a roll having a variable diameter co-operating with said fixed diameter roll, a pair of bushings rotatably mounted in said brackets and having eccentric bearings adapted to rotatably support said variable diameter roll, arms on said bushings, a bar connecting said arms for synchronous rotation of said bushings, and a spring tending to rotate said bushings to move the variable diameter roll toward the fixed diameter roll.

7. In a cutting and folding machine, means for feeding a web of material into said machine, comprising a pair of spaced brackets, a roll having a fixed diameter rotatably mounted in said brackets, a roll having a variable diameter co-operating with said fixed diameter roll, a pair of bushings rotatably mounted in said brackets and having eccentric bearings adapted to rotatably support said variable diameter roll, arms on said bushings, a bar connecting said arms for synchronous rotation of said bushings, a spring tending to rotate said bushings to move the variable diameter roll toward the fixed diameter roll, and means on said arms co-operating with means on said brackets for regulating the position of said variable diameter roll with respect to the fixed diameter roll.

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