

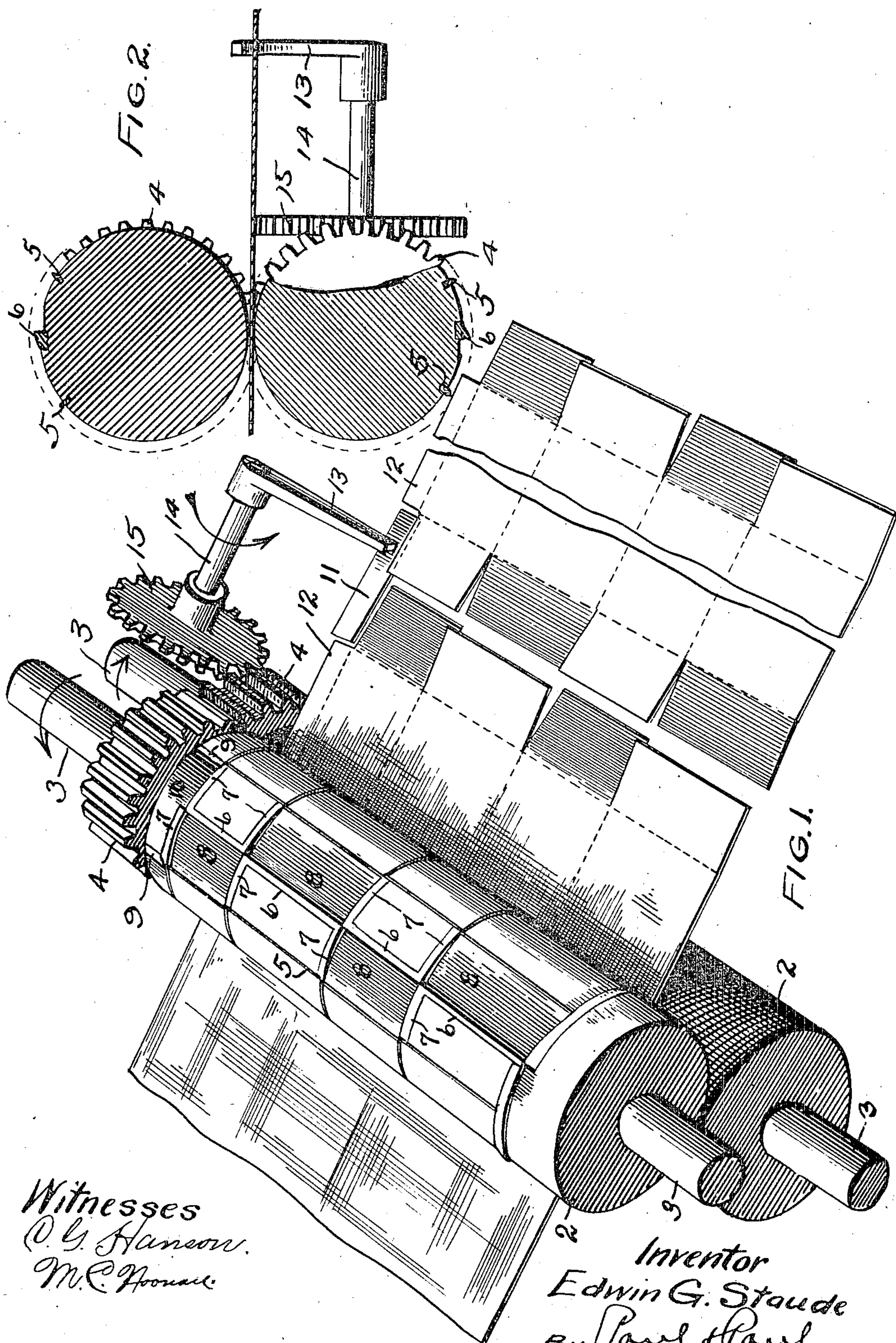
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E. G. STAUDE.

CUTTING ROLLS AND KNIVES FOR BOX MAKING MACHINES.

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# UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

## CUTTING ROLLS AND KNIVES FOR BOX-MAKING MACHINES.

No. 837,353.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed December 12, 1902. Serial No. 134,903.

*To all whom it may concern:*

Be it known that I, EDWIN G. STAUDE, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Cutting Rolls and Knives for Box-Making Machines, of which the following is a specification.

My invention relates to machines for making flexible boxes, and particularly to the cutting rolls and knives therefor.

The object of the invention is to provide blank-cutting means for use in connection with the machine shown and described in Letters Patent of the United States issued December 9, 1902, No. 715,620, wherein the blanks travel in one direction from the rolls through the folding devices to the discharge end of the machine.

A further object is to provide cutting-knives that will cut and sever the blanks of light or heavy stock without danger of tearing or otherwise mutilating it.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in revolving coacting rolls having slitting and severing knives arranged thereon in groups, the groups on one roll being opposite corresponding spaces on the other roll and coinciding therewith as the rolls revolve.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of revolving cutting-rolls, showing the recesses therein and knives alternating therewith. Fig. 2 is a transverse section through the rolls and knives.

In the drawings, 2 represents rolls of the same diameter arranged one above the other and having journals 3, supported in suitable bearings on the frame of the machine. The rolls travel in opposite directions, as indicated by the arrows, to feed the stock between them and are provided with gears 4, operated from a suitable source of power.

In the periphery of each roll, extending lengthwise thereof, I arrange scoring-knives or cutters 5 and severing-knives 6. I also provide transverse cutting or slitting knives 7, arranged substantially at right angles to the severing-knives and conforming to the rounded surface of the roll. The groups of knives are arranged upon opposite sides of an

imaginary line running lengthwise of the rolls, and alternating with said groups I provide recesses or depressions 8 in the peripheries, the recesses of one roll being opposite and adapted to receive the corresponding group of knives on the other roll and each group of knives being adapted when it enters a recess to coact with the knives of the abutting groups, making a shear cut therewith to slit and sever the blanks. I have arranged one row of groups of knives and one of recesses on each roll, so that a blank will be slit and severed with each revolution, and I arrange them zigzag, for I have found that where the knives are arranged in groups close together and operate in quick succession upon the stock if all the knives were arranged in one straight row and the recesses in another the tongues formed in the stock would all be forced up or down, and as the slitting-knives would engage the stock before those that sever it the tongues would be pressed so far one way or the other that it would be necessary to have severing-knives of greater depth than the others, and even then there would be great danger of tearing or otherwise mutilating the stock by the action of the slitting-knives pressing the tongues in one direction before the other knives could perform their function. Furthermore, it would be impracticable to have the severing-knives of greater depth than the others in rolls of small diameter, owing to the fact that the outside or cutting edges of the knives would project too far above the pitch-line of the rolls and the coacting knives would not meet to make a clean shear cut, but would have a rolling motion similar to the addendum of an ordinary gear-tooth.

To obviate the necessity of having knives of different depth and the danger of tearing the stock, I arrange the recesses upon opposite sides of an imaginary line, as described, alternating with the groups of severing and slitting knives, and with this arrangement the stock is pressed up to form one tongue and in the opposite direction to form the other, as shown in Fig. 1, and it is only necessary to have cutting edges of sufficient depth on all the knives to pass through the stock.

At the ends of the rolls I provide knives 9 upon opposite sides of the longitudinal line coöperating with recesses 10 to cut out the waste piece 11 in the sides of the blanks to form the short tongue 12 thereon. It sometimes happens that this waste piece will



stick to the blanks, and I therefore prefer to provide a knocker-arm 13, mounted on a shaft 14, that carries a gear 15, meshing with the gear 4. The gear 15 will have the same number of teeth as the gear 4 and will make one revolution with each revolution of the rolls, so that the arm 13 will be in the proper position to dislodge the waste piece 10 as the blanks pass by.

10 I claim as my invention—

1. The combination with a roll, of severing and slitting knives arranged in sets thereon, the severing-knives extending lengthwise of the roll and the slitting-knives transversely thereof, and the slitting-knives of the contiguous sets being on opposite sides of the severing-knives of those sets, substantially as described.

2. The combination with a roll, of severing and slitting knives arranged in sets or groups thereon, the severing-knives extending lengthwise of the roll substantially in line with one another and the slitting-knives transversely on the roll, and the slitting-knives of contiguous sets being located on opposite sides of the severing-knives of those sets, substantially as described.

3. The combination with the revolving rolls, of slitting or severing knives arranged in sets or groups thereon, the severing-knives extending lengthwise of the rolls and the slitting-knives transversely thereof, and there being blank spaces provided on the surfaces of the rolls alternating with the sets of knives thereon, substantially as described.

4. The combination, with the rolls having peripheral recesses, of severing and slitting knives mounted on said rolls and alternating with said recesses, the knives of one roll being opposite the corresponding recesses in the other roll and having a shear cut with the contiguous knives, for the purpose specified.

5. The combination, with the revolving rolls having peripheral recesses arranged zigzag upon opposite sides of a straight line parallel with the axis thereof, of severing and slitting knives 6 and 7 fitting within sockets in the periphery of said rolls substantially at right angles to each other and in groups alternating with said recesses, each group on one roll being opposite a corresponding recess in the other roll and adapted to enter the

same and have a shear cut with the knives abutting said recess.

6. The combination, with the rolls arranged one above the other and having peripheral depressions or recesses extending in a zigzag row from one end of each roll to the other, of severing and slitting knives 6 and 7 arranged in groups within sockets in the peripheries of said rolls, said groups also extending in zigzag rows from end to end of the rolls and alternating with said recesses, whereby a group of knives in one roll will be opposite a recess in the other roll, comparatively short severing-knives 9 provided near one end of each roll and adapted to enter a corresponding recess in the opposite roll, substantially as described.

7. The combination with a roll, of severing and slitting knives arranged in sets thereon, the severing-knives extending lengthwise of the middle portion of the rolls and the slitting-knives transversely thereof, the slitting-knives of contiguous sets being on opposite sides of the severing-knives of those sets, and there being comparatively short severing-knives 9 at one end of the roll extending lengthwise thereof, and transverse slitting-knives connecting them, substantially as described.

8. The combination with the revolving rolls having peripheral depressions, of the longitudinally-arranged severing-knives and the transversely-arranged slitting-knives alternating on the surface of the rolls with said depressions and the comparatively short severing-knives 9 provided at the ends of said rolls and the slitting-knives connecting the inner ends of said knives 9, substantially as described.

9. The combination, with the revolving rolls having peripheral depressions, of severing and slitting knives alternating with said depressions in the surfaces of the rolls whereby up and down cuts will be alternately made in the stock, substantially as described.

In witness whereof I have hereunto set my hand this 9th day of December, 1902.

EDWIN G. STAUDE.

In presence of—

M. C. NOONAN,  
C. G. HANSON.