May 26, 1931. E. H. TRUMP 1,807,499

STAMPING MACHINE

Filed April 3, 1928 5 Sheets-Sheet 1

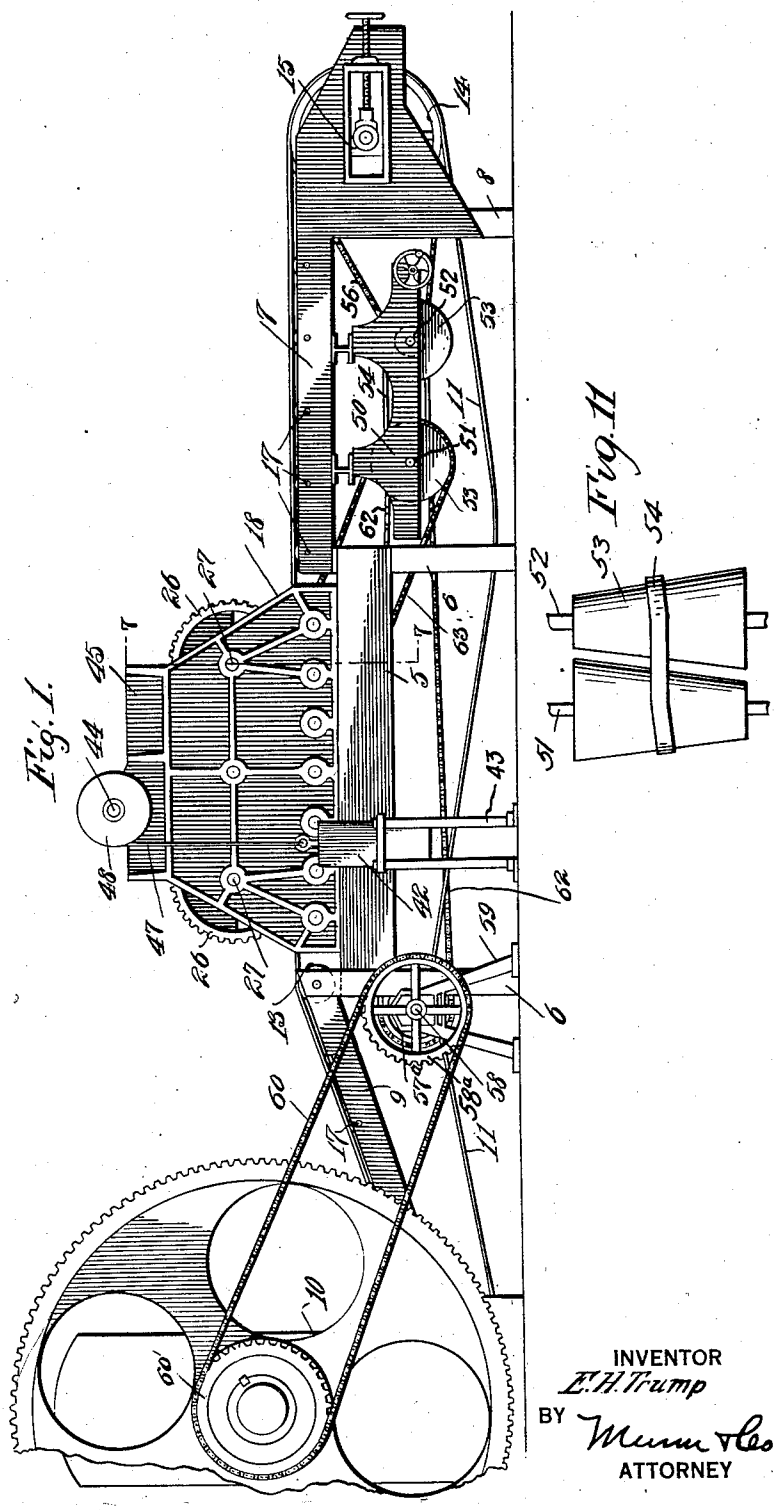


Fig. 1.

Fig. II

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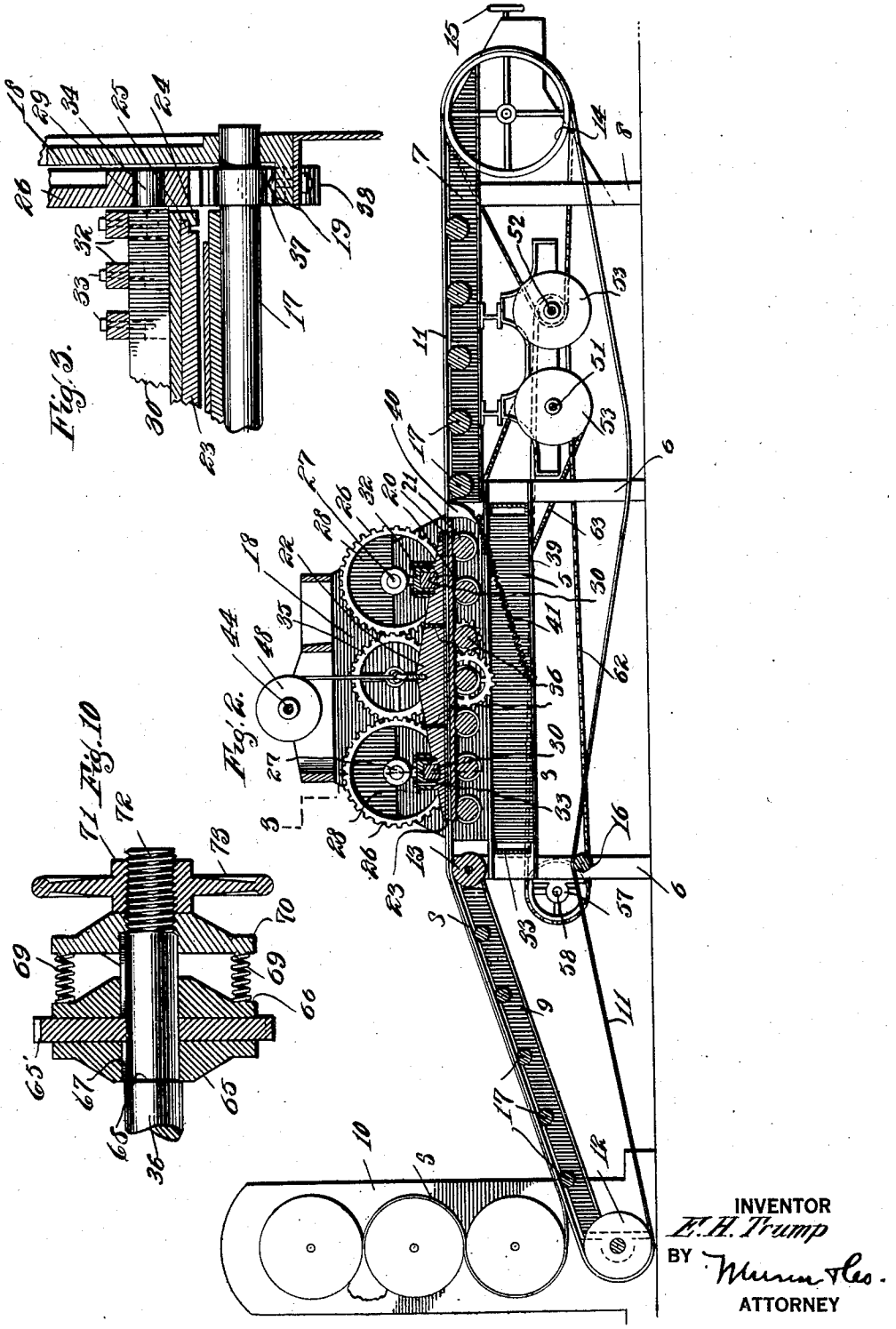


Fig. 3.

Fig. 4.

Fig. 10.

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STAMPING MACHINE

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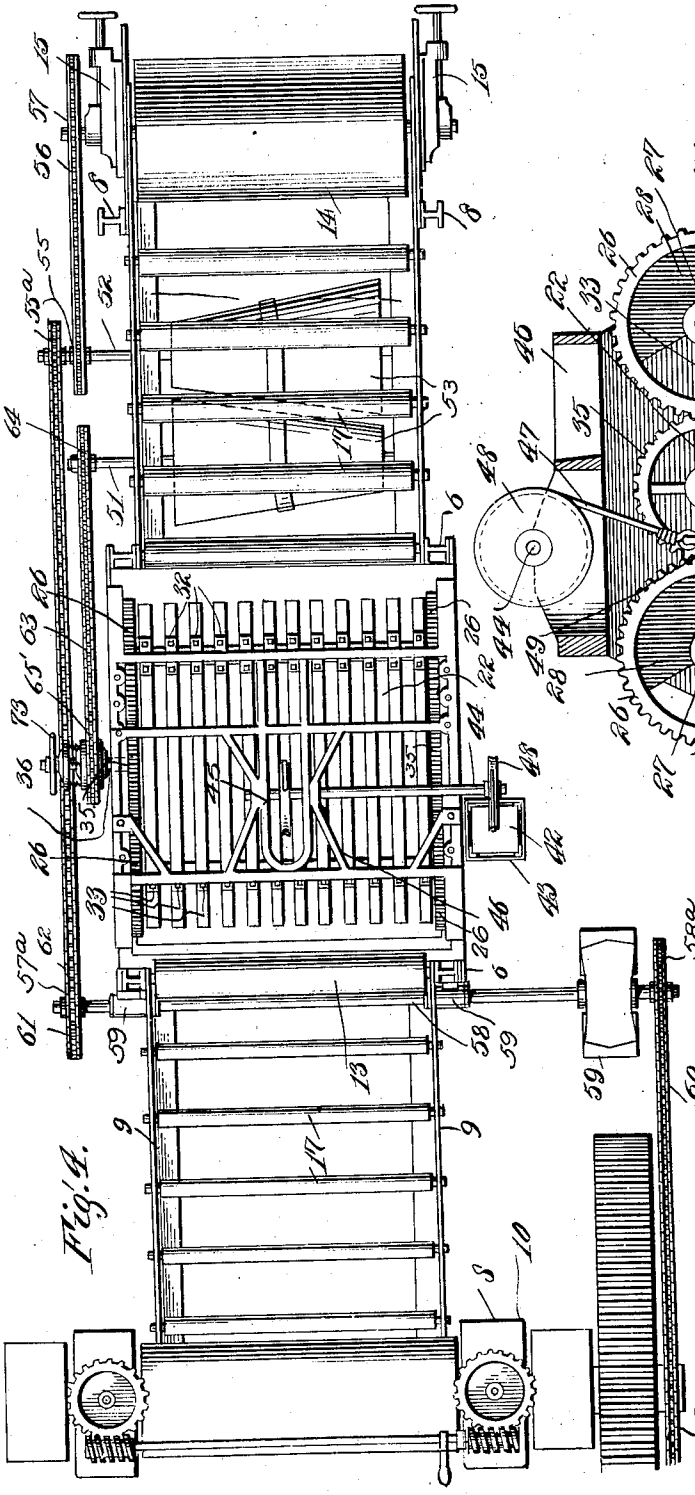


Fig. 4.

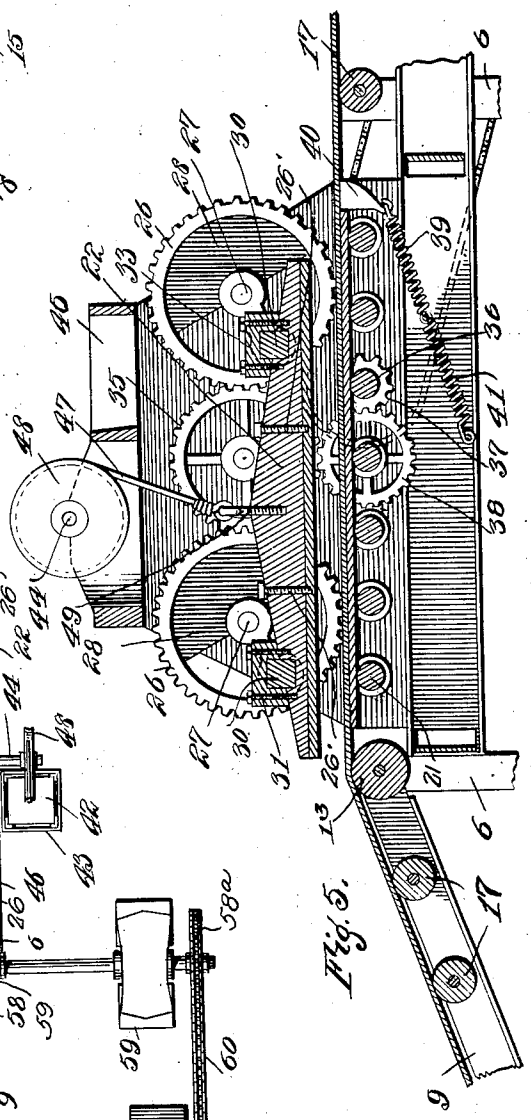


Fig. 5.

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STAMPING MACHINE

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Fig. 6.

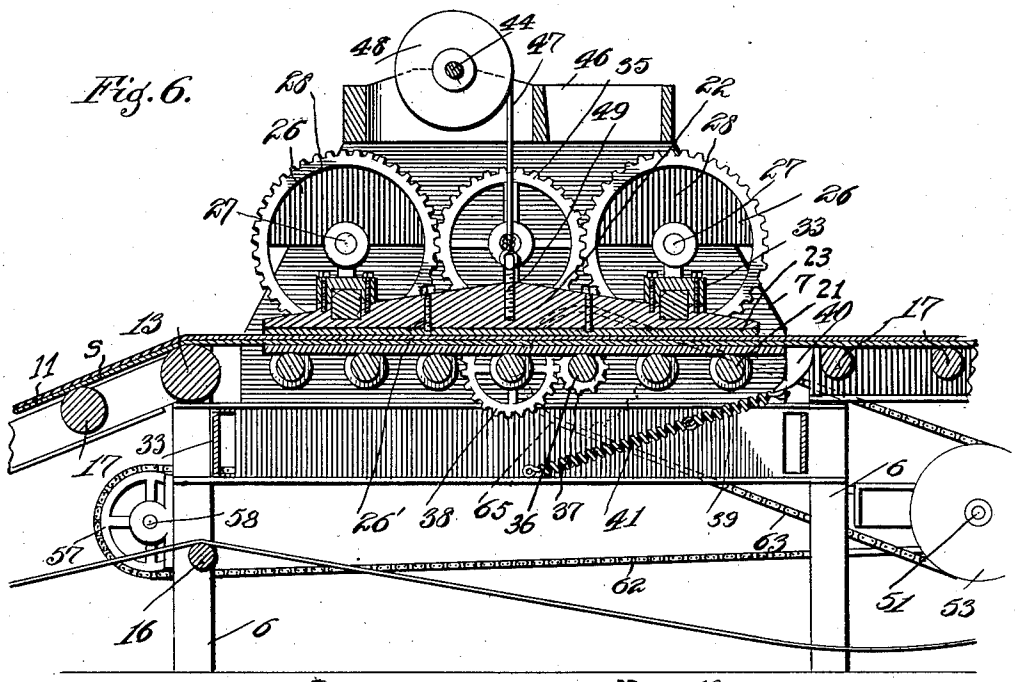
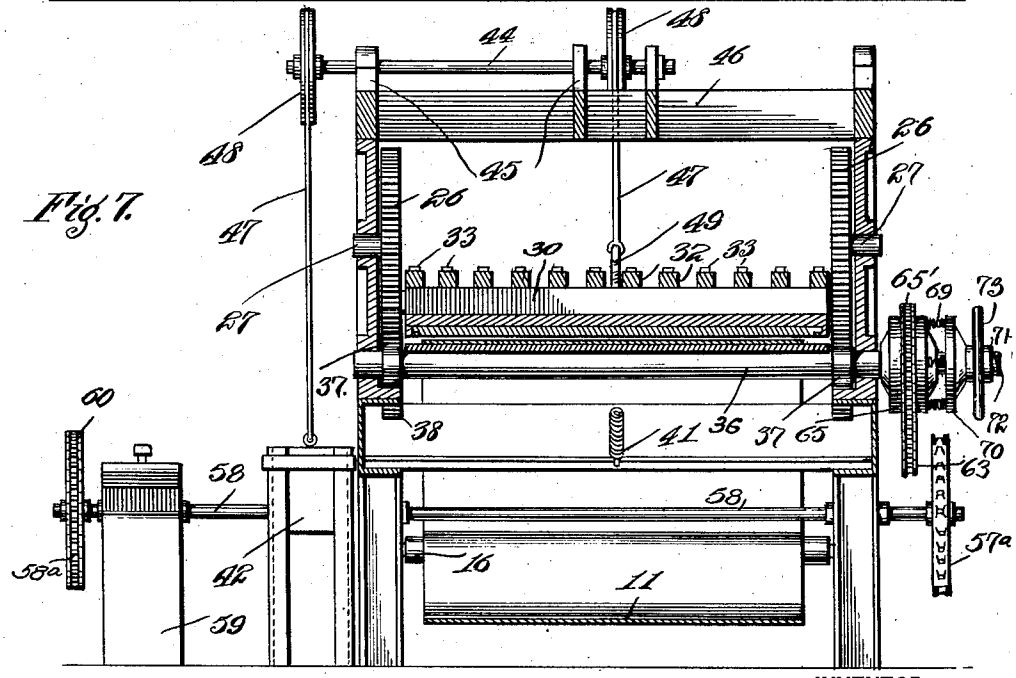


Fig. 7.



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STAMPING MACHINE

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Fig. 8.

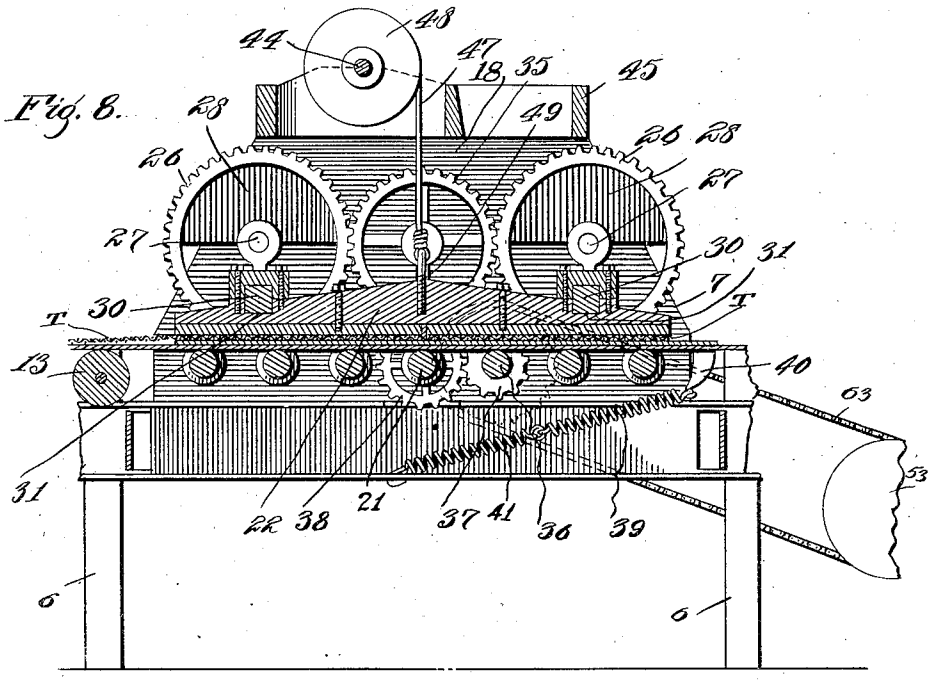
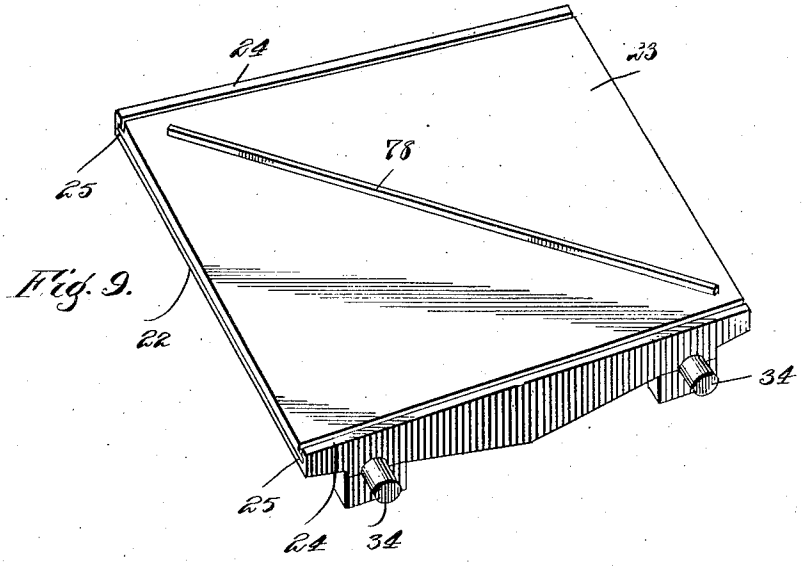


Fig. 9.



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Patented May 26, 1931 1,807,499

UNITED STATES PATENT OFFICE

ELNO H. TRUMP, OF AKRON, OHIO

STAMPING MACHINE

Application filed April 3, 1928. Serial No. 267,001.

My invention relates to stamping machines and more particularly to a machine for stamping rubber articles such as automobile floor mats.

An object of the invention is to provide a stamping machine whereby objects may be continuously and expeditiously stamped from a moving sheet of sheet material.

Further the invention provides an automobile floor mat stamping machine embodying a stamping die which is continuously operated to stamp mats as a longitudinal sheet of rubber or other suitable material is advanced to the same.

The invention also provides a longitudinally movable base plate for cooperation with the die which moves with the die during each stamping operation to eliminate retardation or mutilation to the endless conveyor belt upon which the rubber sheet is carried.

With the preceding and other objects and advantages in mind, the invention consists in the novel combination of elements, constructions and arrangement of parts to be hereinafter specifically referred to, claimed and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the invention;

Figure 2 is a longitudinal sectional view of the same;

Figure 3 is an enlarged fragmentary sectional view taken on line 3—3 of Figure 2;

Figure 4 is a top plan view;

Figure 5 is a fragmentary longitudinal sectional view of the machine and illustrating the stamping die in elevated position;

Figure 6 is a similar view and illustrating the stamping die and coacting base plate in actuated position;

Figure 7 is a transverse vertical section taken on line 7—7 of Figure 1;

Figure 8 is a vertical longitudinal section view of a modified embodiment of the invention;

Figure 9 is a perspective of the cutter used in conjunction with the embodiment of the invention disclosed in Figure 8, and

Figure 10 is a detail view of the slip clutch embodied in the invention.

Fig. 11 is a detail of a variable speed transmission.

Referring to the invention in detail a horizontally disposed table comprising a main rectangular frame 5, supported from legs 6, parallel side members 7 attached to one end of the frame and supported at their outer ends by legs 8, is provided. Attached to and extending forwardly from the upper ends of the legs 6, at the forward end of the main frame, is a pair of inclined angle rails 9 which are attached to the lower end of the frame of a conventional calender 10 from which sheet rubber is conveyed by means of an endless conveyor belt 11.

As illustrated in Figure 2 the conveyor belt 11 is trained over rollers 12 and 13, journalled at the ends of the rails 9, and over a main drive roller 14 supported in the outer ends of the side members for longitudinal adjustment in adjustable bearings 15. The lower stretch of the belt extends beneath the table and passes over a suspension roll 16 journalled in the forward leg 6. To retain the conveyor belt against sagging as it passes over the table, a plurality of parallel rollers 17 with which the belt contacts is journalled in the angle rails 9 and side members 7, respectively. It will be observed from the description thus far given that the rubber sheet S, formed and fed from the calender, is picked up by the conveyor belt 11 adjacent the lower ends of the angle rails and conveyed longitudinally of the table.

For the purpose of stamping articles from the rubber sheet, such as automobile floor board mats, a continuously operated die is provided. This die is mounted in upstanding parallel plates 18, secured to the upper face of the frame 5 by fastenings 19, and extending parallel to the side members 7. A base plate 20 resting on horizontally disposed parallel rollers 21 extending transversely of the frame and journalled therein, is slidable longitudinally of the frame. A relatively flat die head 22 is mounted between the plates 18 and above the base plate 20 for cooperation therewith in stamping articles from the sheet S as it is advanced over the base plate. The die head may be

made of a plurality of bar elements, if desired. A suitable pattern plate 23 is detachably carried upon the under face of the die head, and for this purpose the die head is formed with U-shaped guide flanges 24 at its opposite longitudinal edges for the reception of outstanding marginal flanges 25 on the pattern plate. (See Fig. 3.) Removable fastenings 26′ engage the die head and pattern plate to hold the latter against longitudinal movement relative to the die head.

To impart a translatory motion to the die head, pairs of transversely alined gears 26 fixed to stub shafts 27 journalled in the upstanding plates 18 are provided. These gears are counter-weighted as at 28 and are provided with bearing openings 29 at points diametrically opposite the counter-weights 28. Rectangular bars 30 extend transversely of the die head adjacent its opposite ends and are seated in parallel grooves 31 extending entirely across the upper face of the die head. U-shaped straps 32 embrace the bars at spaced intervals and are secured to the die head by removable fastenings 33. These bars terminate in laterally projecting trunnions 34 which are loosely received in the bearing openings 29 to eccentrically connect the bars to the pairs of coinciding gears 26. To rotate the gears 26 a drive gear 35 is journalled upon each of the upstanding plates 18 between the adjacent gears 26, and meshes with the latter as particularly illustrated in Figure 2. To drive the gears 35 a counter shaft 36, extending transversely of the table below the gears 35 and offset therefrom, is journalled in the frame 5, the shaft 36 carrying spur gears 37 adjacent its ends which mesh with larger gears 38 loose on one of the rollers 21. These gears 38 mesh with the gears 35 and rotate the latter in a clockwise direction. Incident to the clockwise rotation of the drive gears 35, the counter-balanced gears will be rotated in a counter-clockwise direction and hence impart a translatory motion to the die head.

When the die head is resting upon the sheet material and base plate to perform the stamping operation, it follows that the base plate must shift forwardly with the die head. Therefore the base plate is arranged for longitudinal movement on the rollers 21, as above stated. To return the base plate to normal position subsequent to each longitudinal movement by the die head, divergent contractile springs 39 are anchored to hooks 40 depending from one end of the base plate and are connected to a single spring 41 anchored to the frame 5. It will be observed that each time the base plate is advanced the contractile springs are tensioned to return the base plate to normal position as the die head ascends.

Cooperating with the counter-weighted gears 26 in lifting the die head after each stamping operation is a weight 42 which is vertically movable in a rectangular casing or guide 43 arranged to one side of the frame 5. (See Figs. 1 and 7.) The weight 42 is operatively connected with the die head by means of a shaft 44 extending transversely of the frame 5 and journalled in bearings 45 cast with an upper bracing structure 46 which bridges the frame 5 and integrally connects the upper ends of the plates 18. Flexible elements 47 are attached to pulleys 48 fixed to the shaft 44 at points above the die plate and weight 42, respectively. One of these flexible elements is attached to an eye 49 projecting vertically from the center of the die head, while the other flexible element is attached to the weight 42.

For the purpose of causing the conveyor belt 11 and die head 22 to move in synchronism a variable speed transmission 50 is provided, the latter being supported from the side members 7, as particularly illustrated in Figure 1. This variable speed transmission as shown includes shafts 51 and 52 which project from one side of the table and are equipped with friction cones 53 operatively connected together by a drive belt 54. At its outer end the shaft 52 carries a pair of sprocket wheels 55 and 55*a*, one of which is operatively engaged by a sprocket chain 56 passing around a sprocket 57 fixed to one end of the roller 14.

A main power shaft 58 extends transversely beneath the table between the calender and frame 5 and is journalled in bearings 59. The drive shaft 58 carries at one end a sprocket gear 58*a* which is engaged by a drive chain 60 engaged with a sprocket wheel 60′ fixed to one of the calender rolls. The opposite end of shaft 58 carries a sprocket wheel 57*a* engaged by a sprocket chain 62 which is also engaged with the sprocket wheel 55*a* on the shaft 52 and by means of which shafts 51 and 52 are driven.

Power is transmitted from the shaft 51 to the counter shaft 36 by means of a sprocket chain 63 engaged with a sprocket wheel 64 fixed to this shaft 51 and with a sprocket wheel 65′ normally rotatable with the counter shaft. The sprocket wheel 65′ is arranged between coacting friction clutch disks 65 and 66 which are keyed to the counter shaft by keys 67*a*. The disk 65 abuts an annular shoulder 68 formed on the counter shaft, while the disk 66 is held yieldably engaged with sprocket 65 by a coiled expansion spring 69 arranged between disk 66 and a follower 70 keyed to shaft 36. This spring also urges follower 70 longitudinally into engagement with the hand wheel 73. The annulus or follower 70 is adjustable longitudinally to regulate the degree of friction with which the clutch disks engage the sprocket wheel 65′ by means of the wheel 70 having a hub 71 threaded upon the threaded end 72 of the

counter shaft. By the provision of the loosely mounted sprocket wheel 65′ the die head and endless belt will be actuated in synchronism. That is to say, the endless belt and die head will travel at the same speed while the die head is pressing against the belt.

The slip clutch shown in detail in Fig. 10 takes care of the difference in travel between the cutting head and the conveyor belt and the return of the cutting head is either speeded up or slowed down according to the length of cut desired. As the head and cutting die come in contact with the work at hand, the work and the conveyor belt carry the head through at belt speed. The head is very carefully balanced so that it does not require any great amount of driving power to drive it, therefore the slip clutch is set with just sufficient driving power to a little more than bring the head back to the work in the proper time.

The calender 10 is driven from a main power source, such as an electric motor, not shown.

In Figures 8 and 9 a modification of the invention is disclosed. This modification is an adaptation of the stamping machine as a textile fabric cutter. The die plate 23 carries a diagonally disposed knife blade 78 for severing a longitudinal sheet of textile fabric T such as is used in tire construction, on a bias. Instead of running the endless conveyor belt over the base plate as above set forth, it is, in this instance, passed between the rollers 21 and the base plate, while the fabric sheet passes over the upper face of the base plate where it is cut into diagonal strips as it is advanced, by the cutting knife.

In the operation of the machine, power being applied to the power shaft, the endless conveyor belt is driven in a longitudinal direction to feed the sheet S to the moving die head. The conveyor belt and die head being timed to move in synchronism by means of the variable speed transmission 50, a mat or other flat article is stamped from the sheet each time the die head approaches the base plate. During each stamping operation the die head shifts longitudinally with the conveyor belt and sheet S. Incident to the longitudinal shifting of the die head the base plate is moved longitudinally on the rollers 21, tensioning the contractile springs. As the die head begins to ascend, preparatory to the next stamping operation, the base plate is returned to normal position by the contractile springs. Should the conveyor belt or die head for any reason tend to move at different speeds, they will be caused to move in unison by means of the coacting friction clutch disks and loosely mounted sprocket wheel on the counter shaft.

What is claimed is:—

1. In a stamping machine, a horizontal support over which sheet material is fed, pairs of coinciding transversely alined rotatable elements arranged above the support, and a die eccentrically supported adjacent its ends from the coinciding rotatable elements.

2. In a stamping machine, a horizontal support over which sheet material is fed, pairs of coinciding transversely alined rotatable elements arranged above the support, and a die eccentrically supported adjacent its ends from the coinciding rotatable elements, and a longitudinally shiftable base plate cooperating with the die in stamping articles from the sheet material.

3. In combination a horizontal roller mechanism for supporting advancing sheet material, a die element mounted for translatory movement and adapted to stamp articles from the sheet material as it is advanced, means for operating said die element, a base plate cooperating with the die element and movable horizontally therewith while said element is in contact with the sheet material, and means to return said base plate to initial position.

4. In combination a horizontal support over which sheet material is advanced, a translatory movable die element operating to stamp articles from the sheet material as it is advanced, a base plate cooperating with the die element and movable horizontally therewith while the die element is in contact with the sheet material, and means normally urging the base plate in a direction opposite the direction of travel of the sheet material.

5. In combination a longitudinally shiftable base normally urged in one direction and over which sheet material is advanced, and a die mounted for translatory movement above the base and causing the base to shift in the direction of travel of the sheet material while the die is engaged with the latter.

6. In combination a longitudinally shiftable base plate normally urged in one direction, a conveyor movable over the base plate for feeding sheet material in a longitudinal direction, and a die mounted for translatory movement and cooperating with the base plate in stamping articles from the sheet material, the die causing the base plate to shift in the direction of travel of the sheet material while the die is in contact therewith.

7. In combination a support, a horizontally disposed longitudinally shiftable base plate mounted thereon, means normally urging the base plate in one direction, and a die movable in a translatory path and cooperating with the base plate in stamping articles from the sheet material, the die causing the base plate to shift in the direction of travel of the sheet material while in contact therewith.

8. In combination a horizontal support, parallel rollers journalled on the support, a base plate longitudinally movable on the

rollers, and a translatory movable die above the base pate and cooperating therewith in stamping articles from sheet material moving longitudinally over the base plate, the base plate and die being caused to shift in unison while the die is in contact with the sheet material.

9. In combination a horizontal support, a plurality of parallel rollers journalled on the support, a longitudinally shiftable base plate supported on the rollers, an endless belt movable over the base plate for conveying sheet material, and a horizontally and vertically movable die cooperating with the base plate in stamping articles from the sheet material as it is conveyed over the base plate.

10. In combination a horizontal support, a plurality of parallel rollers journalled on the support, a longitudinally shiftable base plate supported on the rollers, an endless belt movable over the base plate for conveying sheet material, a horizontally and vertically movable die cooperating with the the base plate in stamping articles from the sheet material as it is conveyed over the base plate, and means for returning the base plate to normal position subsequent to each stamping operation.

11. In combination a horizontal support, a plurality of parallel rollers journalled on the support, a longitudinally shiftable base plate supported on the rollers, an endless belt movable over the base plate for conveying sheet material, a horizontally and vertically movable die cooperating with the base plate in stamping articles from the sheet material as it is conveyed over the base plate, and contractile springs operatively connected with the base plate for returning the same to normal position subsequent to each stamping operation.

12. In a stamping machine, a horizontally disposed base over which sheet material is advanced in a longitudinal direction, a train of gears upon each side of the base plate, one of each train being operatively connected with a power source, and a die eccentrically connected with certain of the gears of each train whereby it is continuously raised and lowered to stamp articles from the sheet material.

13. In a stamping machine, a base, a conveyor belt movable over the base for conveying sheet material, a die supported above the base plate for translatory motion, a source of power for the endless belt, a counter shaft driven from such power source and operatively connected with the die, and a slip clutch on the counter shaft whereby to permit the endless belt and die to move at the same speed while the die is in contact with the sheet material.

14. In a stamping machine, a longitudinally shiftable base plate, an endless belt movable over the base plate for conveying sheet material, a die cooperating with the base plate in stamping articles from the sheet material and movable in a translatory path, gearing for imparting motion to the die, drive means for the belt and gearing, and means automatically operable to cause the belt and die to move at the same speed while the die is in contact with the sheet material.

15. In a stamping machine, a longitudinally shiftable base plate, a conveyor belt movable over the base plate for carrying sheet material, a die mounted above the base plate for translatory movement and cooperating with the latter in stamping objects from the sheet material, a common drive for the belt and die and automatically operable means for causing the die and conveyor belt to move at the same speed while the die is in contact with the belt.

16. In a machine of the character described, a horizontally supported base plate, an endless belt movable over the base plate for carrying sheet material, rotatable elements supported above the base plate, a die connected to the rotatable elements for translatory motion and cooperating with the base plate in stamping articles from the sheet material, a source of power for driving the belt, a counter shaft driven from such power source, a drive element normally rotatable with the counter shaft and operatively engaging the rotatable elements to transmit motion to the die but permitted to move relative to the counter shaft as the die approaches the base plate so that the die and endless belt will move at the same speed while the die contacts with the sheet material.

17. In combination a horizontally disposed base plate, a conveyor movable over the base plate for carrying sheet material, a drive shaft operatively connected with the conveyor, gearing supported above the base plate, a die supported from the gearing to move in a translatory path and cooperating with the base plate in stamping articles from the sheet material, a counter shaft geared to the gearing and driven from the drive shaft, and means on the counter shaft for permitting the latter to attain the same speed as the gearing when the die approaches the base plate whereby to cause such die and endless belt to move in synchronism.

18. In a stamping machine, a table, a belt movable thereover to advance sheet material longitudinally of the table, a translatory die above the table and cooperating therewith in stamping articles from the sheet material, drive means for the belt and die, and a driven element interposed between the drive means and die and capable of rotation relative to the drive means so that the die can move with the sheet material when in contact therewith.

19. In a stamping machine, a table, a conveyor belt movable thereover for advancing

sheet material in a longitudinal direction, a translatory die above the table, gearing to which the die is operatively connected, drive means for the belt, a counter shaft driven from the drive means, and a drive element normally rotatable with the counter shaft and engaging the gearing but permitted to rotate at the same speed as the drive means regardless of the speed of the gearing.

20. In a stamping machine, a table, a conveyor belt movable thereover for advancing sheet material in a longitudinal direction, a translatory die above the table, gearing to which the die is operatively connected, drive means for the belt, a counter shaft geared to the gearing, and an operative connection between the drive means and counter shaft whereby the operative connection may rotate at the same speed as the drive means regardless of the speed of the gearing.

21. In a stamping machine, a table, a conveyor belt movable thereover for advancing sheet material in a longitudinal direction, a translatory die above the table, gearing to which the die is operatively connected, drive means for the belt, a counter shaft geared to the gearing, a drive element loose on the counter shaft and driven from the drive means, and a friction clutch on the counter shaft and normally causing the drive element to rotate therewith but permitting the counter shaft and drive element to be rotated independently whereby the advancement of the sheet material and stamping operation will be synchronized.

22. In a stamping machine, a table, a conveyor belt movable thereover for advancing sheet material in a longitudinal direction, a translatory die above the table, gearing to which the die is operatively connected, drive means for the belt, a counter shaft geared to the gearing, a driven element loose on the counter shaft and driven from the belt drive means, and friction disks keyed to the counter shaft and frictionally engaging the driven element whereby to permit the counter shaft and driven element to rotate independently at predetermined times.

23. In a stamping machine, a table, a conveyor belt movable thereover for advancing sheet material in a longitudinal direction, a vertically movable die above the table, gearing to which the die is operatively connected, drive means for the belt, a counter shaft geared to the gearing, a driven element loose on the counter shaft and driven from the belt drive means, friction disks keyed to the counter shaft and frictionally engaging the driven element whereby to permit the counter shaft and driven element to rotate independently at predetermined times, and a variable speed mechanism associated with the belt drive means and counter shaft.

24. In combination, a table, an endless belt movable over the table to advance sheet material in a longitudinal direction, and a die operating above the table to stamp articles from the sheet material and movable in planes parallel and at right angles to the path of movement of the sheet material.

25. In combination, a table, an endless belt movable over the table to advance sheet material in a longitudinal direction, a die operating above the table to stamp articles from the sheet material and movable in planes parallel and at right angles to the path of movement of the sheet material, and means normally urging the die in a vertical direction.

26. In combination, a table, an endless belt movable over the table to advance sheet material in a longitudinal direction, a die operating above the table to stamp articles from the sheet material and movable in planes parallel and at right angles to the path of movement of the sheet material, and a counter balancing weight arranged to urge the die in an upward direction.

27. In combination, a table, an endless belt movable over the table to advance sheet material in a longitudinal direction, and a die operating above the table to stamp articles from the sheet material and movable in planes parallel and at right angles to the path of movement of the sheet material, a rotatable element supported above the die and having operative connection therewith, and means associated with the rotatable element normally urging the same in a direction to exert a lifting action on the die.

28. In combination, a table, an endless belt movable over the table to advance sheet material in a longitudinal direction, a die operating above the table to stamp articles from the sheet material and movable in planes parallel and at right angles to the path of movement of the sheet material, a shaft supported above the die and extending transversely of the table, a flexible element operatively connected with the shaft and die, a second flexible element connected with the shaft, and a weight suspended from such flexible element and normally urging the shaft in a direction to exert a lifting action on the die.

29. In a stamping machine, a table over which sheet material is fed in a longitudinal direction, a die above the table and movable in planes parallel to the path of movement of the sheet material and at right angles thereto, and a base plate cooperating with the die in stamping articles from the sheet material and movable with the die while engaged with the sheet material.

30. In a stamping machine, a table over which sheet material is fed in a longitudinal direction, a die above the table and movable in planes parallel to the path of movement of the sheet material and at right angles thereto, a base plate cooperating with the die in stamping articles from the sheet material

and movable with the die while engaged with the sheet material, and means for returning the base plate to normal position after the die moves away from the sheet material.

31. In a stamping machine, a table over which sheet material is advanced, rotatable elements disposed upon opposite sides of the table, a die above the table, trunnions carried by the die at opposite sides thereof and eccentrically connected with the die whereby the latter will be continuously actuated in a translatory path, and means normally exerting an upward lift on the die.

32. In a stamping machine, a table over which sheet material is advanced, rotatable elements disposed upon opposite sides of the table, a die above the table, trunnions carried by the die at opposite sides thereof and eccentrically connected with the die whereby the latter will be continuously actuated in a translatory path, and a base plate supported on the table and cooperating with the die in stamping articles from the sheet material.

33. In a stamping machine, a table over which sheet material is advanced, rotatable elements disposed upon opposite sides of the table, a die above the table, trunnions carried by the die at opposite sides thereof and eccentrically connected with the die whereby the latter will be continuously actuated in a translatory path, a base plate supported on the table and cooperating with the die in stamping articles from the sheet material, and resilient means operatively connected with the base plate and urging the same in a direction opposite the path of movement of the sheet material.

Signed at Akron, in the county of Summit and State of Ohio, this 23rd day of February, A. D. 1928.

ELNO H. TRUMP.